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THE UNIVERSITY OF HONG KONG

THE VALUE OF THE PROVISION OF GREEN FEATURES IN PRIVATE RESIDENTIAL DEVELOPMENTS UNDER THE GOVERNMENT'S INCENTIVES POLICY

A DISSERTATION SUBMITTED TO
THE FACULTY OF ARCHITECTURE
IN CANDIDACY FOR THE DEGREE OF
BACHELOR OF SCIENCE IN SURVEYING

DEPARTMENT OF REAL ESTATE AND CONSTRUCTION

BY
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HONG KONG
APRIL 2008

DECLARATION

I declare that this dissertation represents my own work, except where due acknowledgement is made, and that it has not been previous included in a thesis, dissertation or report submitted to this University or to and other institution for a degree, diploma or other qualification.

Signed: _____

Name: _____

Date: _____

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All faults are mine.

Lo Lok Wa

April 2008

ABSTRACT

Since the implementation of the Government's incentives policy in green features provision in property developments in 2001, buildings encompassing the listed green features are gradually transforming the cityscape of Hong Kong. However, the policy is always under controversy. There is heated debate on whether the policy is a step forwards to developing a greener built environment in Hong Kong, or a mechanism for property developers to make more profit from selling more floor space given to them for nearly free. This dissertation aims at studying the green features of a property development under the incentives policy. By finding the value of the provision of balconies and utility platforms to the property prices, it is an attempt to discover the environmental value of these features from the perspective of property purchasers.

A property development that satisfies the conditions of the study is identified and its transaction records are analysed by the hedonic price model. Contrary to common expectation, the result of the study shows that the provision of balconies and utility platforms does not guarantee an increase to property prices, either for the whole unit or per area unit rate. Property purchasers would only appreciate the provision of the green features if they are large enough to permit flexible use and full utilisation of the space. Otherwise, they would perceive the structure inferior to enclosed indoors space of their units, despite its function of view enhancement and environmental improvement.

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Chapter One

INTRODUCTION

1.1 Background

Hong Kong has always been named as a 'concrete jungle'. With a huge population but extremely limited flat and buildable land, population as well as building density is extremely high in Hong Kong. The result is a characteristic compact urban centre packed with high-rise, high-density buildings and an exceptionally tight living space that severely compromise spatial quality, privacy, natural lighting and ventilation, and views (Cole, 2006)[1].

With an attempt to create a more comfortable urban living environment with the advanced technology and an improving living standard, the natural environment is often scarified or being totally forgotten. In fact, the real estate industry is extremely demanding on natural resources. Construction of new buildings, operation of existing buildings and demolition of old buildings consume a lot of

[1] Cole, R. J. (2006). Shared markets: coexisting building environmental assessment methods. *Building Research & Information, 34*(4), 357-371.

energy. Vast amount of other resources such as timber, concrete and steel are used in the construction of new buildings, which become construction waste when the buildings are demolished and require land resources for waste disposal. Furthermore, buildings in operation also use up natural resources, such as water and gas, and generate pollution to the environment. Therefore, though it may sound contradicting, it is true to say that "economic growth is a fundamental driver of human welfare, and a key component of sustainable development. However, due to inappropriate incentives, economic activities have often taken a toll on the environment and natural resources, both nationally and globally." (Organisation for Economic Co-operation and Development., 2001)[2]

Nevertheless, Hong Kong, following the rest of the world, has started picking up the trend of environmental protection in different industries including the real estate industry. We have established our own environmental assessment method (HK-BEAM) which is highly recognised by the industry. Both the government and private sectors are keen on implementing environmentally protective measures by means of construction site management, architectural design, choice of building materials and facility management of existing buildings etc. in order to obtain a good rating in the HK-BEAM Standard. Innovative building designs and management are often found in these projects.

[2] Organisation for Economic Co-operation and Development (2001). *Sustainable development: critical issues*. Paris, France: OECD.

On the other hand, the government is also working towards improving the built environment. Alongside with the ordinary development control framework that involve land lease control, planning control and building control, the government has implemented various policies either to require buildings to take action in environmental protection or to provide incentives to encourage the design and construction of buildings that are more environmentally friendly. Of all the policies implemented, the most debated one must be the incentives to promote the construction of green and innovative buildings.

In 2001 and 2002, the Buildings Department, Lands Department and Planning Department have issued two Joint Practice Notes (JPN1 and JPN2) to encourage the provision of green features in building developments, in return for exemption from calculation of gross floor area (GFA) or site coverage for areas occupied by the green features subject to certain criteria. For nil to a small amount of premium, property developers can choose from a list of 12 green features[3] to incorporate into their development.

Although some welcome the policy as the start of a greener built environment, it is also under heavy criticism. Common criticisms include increasing the building bulk and density; allowing developers to inflate and sell more floor area without paying for it; and being bureaucratic but not green nor innovative.

[3] The 12 green features are balconies, wider common corridors and lift lobbies, communal sky gardens (in domestic buildings), communal podium gardens (in commercial or industrial buildings), acoustic fins, sunshades and reflectors, and wing walls, wind catchers and wind funnels from JPN1; and communal sky gardens (in non-domestic buildings), precast external walls, utility platforms, mail delivery rooms and noise barriers from JPN2.

At the end, are the green features really environmentally friendly? Should the policy be continued, or should it be modified? To date there are not many researches strictly on the provision of green features under the incentive scheme. This study is an attempt to study the two most commonly adopted green features which can be privately owned by property purchasers, namely balconies and utility platforms, if they are valuable to property purchasers.

1.2 Objectives

Objectives of the study are:

1. To identify the most commonly adopted green features in property developments;
2. To examine the impacts of the identified green features on the property prices of a property development; and
3. To derive from the impacts any environmental values of the green features.

1.3 Methodology

Before investigating the outcomes of the green features incentives policy, the definition of sustainable development and green buildings must be known first. Literatures on similar topics in relevant materials including textbooks, journals,

legislation, practice notes and reports will be reviewed to understand the meanings of the terms.

The hedonic price model will be employed in this research as a tool to examine the impacts of green features on the property prices of a property development. The model is widely adopted in literatures to investigate effect of different housing attributes on property prices, similar technique from these literatures will be applied to the model in this research.

To restrict the examination of green features to those provided with the government's incentives policy, a housing development under the policy is identified. To further differentiate the green features from those prior to the incentives policy, which are mostly in larger or more prestige units, the housing development to be studied will be one which provide small to medium units, which green features are not common prior to the policy.

1.4 Structure of Dissertation

This dissertation is divided into six chapters. Following the introduction here in chapter one which outlines the background, objectives and methodology of the study and the structure of the dissertation, a literature review will be given in chapter two. In the literature review, the rising consciousness on environmental protection by the general public as well as the construction sector around the

world will be illustrated. The definition of sustainable development as well as the definition's application in Hong Kong will be discussed. A comparison will be drawn between the definition of sustainable buildings and green buildings, followed by a study of green buildings development in Hong Kong. A summary of the Government's policies in green buildings development will be given in chapter three.

In chapter four, the methodology employed in this study will be explained, and the criteria and sources of relevant data collection will be discussed. Empirical results together with analysis will be produced in chapter five.

To provide some conclusions to the dissertation, findings of the study and their implication will be summarised in chapter six. Limitations of the study will be identified and areas for further research will be suggested as well.

Chapter Two

LITERATURE REVIEW

2.1 Introduction

Throughout the history of mankind, economic development is always linked to depletion of the environment. As a matter of fact, there was a misconception in the construction industry and even the society as a whole in the past few centuries, that the world is like an infinite sink of human wastes and pollution (Moavenzadeh, 1994)[4]. It was a universal thought that the world would be able to disperse and neutralise by-products of human activities by its natural processes in the atmosphere, soil and water bodies if given enough time. The reality, however, is that "resource consumption already exceeds the productive capacity of critical biophysical systems on every continent", and "waste production already breaches the assimilative capacity of many ecosystems at every scale" (Rees, 1999)[5]. Public awareness of climate change and environmental degradation is

[4] Moavenzadeh, F. (1994). Global construction and the environment: strategies and opportunities. New York: Wiley.
[5] Rees, W. E. (1999). The built environment and the ecosphere - a global perspective. *Building Research and Information, 27*(4&5), 206 - 220.

currently set amidst a host of other pressing concerns that include national security, volatile energy prices and over-taxed infrastructures(Cole, 2005)[6].

2.2 The construction sector

Over the world, the building and construction sector accounts for around one-tenth of the world's GDP, at least 7% of its jobs, half of all resource use, and up to 40% of energy use and greenhouse gas emissions (United Nations Environment Programme., 2003)[7]. Locally in Hong Kong, the economic activity of the construction sector contributed around three to four percent (at Current Factor Cost) to the GDP in the past few years (Census and Statistics Department., 2008)[8]. It may appear that the importance of the construction sector in Hong Kong is not comparable to various sectors under the services industry, which contributed around 90 percent (at Current Factor Cost) to the GDP in the same period of time. But as (Moavenzadeh, 1994) pointed out that economic developments and constructions are closely linked together, because the types of development projects range from commercial offices, industrial factories to apartment buildings and various types of residential houses. Indeed, as nearly all human activities are conducted in built environment nowadays, the building and

[6] Cole, R. J. (2005). Building environmental assessment methods: redefining intentions and roles. *Building Research and Information, 33*(5), 455-467.
[7] United Nations Environment Programme. (2003). Industry and Environment. *26*(2-3) , 3.
[8] Census and Statistics Department. (2008). *Hong Kong in Figures (2008 Edition)*. Hong Kong: Government Printer.

construction sector and the life cycle of buildings do have a huge impact to the environment.

While the construction industry creates and provides facilities for human activities and social development, its impacts on the environment are indisputable (Bossink & Brouwers, 1996; C. M. Tam, Tam, & Zeng, 2004)[9,10]. Traditionally, construction project performance has been measured in terms of time, cost and quality. Lately, the environment has been considered as the fourth dimension (Shen & Tam, 2002; C. M. Tam et al., 2004; V. W. Tam & Le, 2007)[11,12], as illustrated in Figure 1.

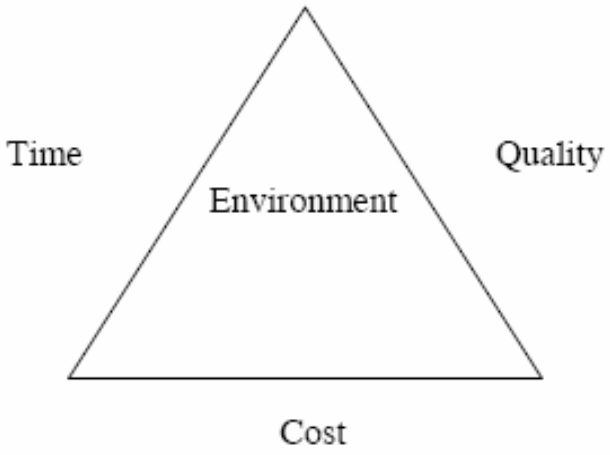

Figure 1 The four dimensions of construction project management (Shen & Tam, 2002)

[9] Bossink, B., & Brouwers, H. (1996). Construction waste: quantification and source evaluation. *Journal of Construction Engineering and Management, 122*(1), 56-60.
[10] Tam, C. M., Tam, V. W. Y., & Zeng, S. X. (2004). Environmental performance assessment in China and Hong Kong. *Building Research & Information, 32*(2), 110-118.
[11] Shen, L. Y., & Tam, W. Y. V. (2002). Implementing of environmental management in the Hong Kong construction industry. *International Journal of Project Management, 20*(7), 535-543
[12] Tam, V. W., & Le, K. N. (2007). Assessing Environmental Performance in the Construction Industry. *Surveying and Built Environment, 18*(2), 59-72

2.3 Definition of sustainable development

It was not until the 1970s and 1980s that public concern on the environment has started intensifying dramatically (Moavenzadeh, 1994). During the period of time, different definitions of the concept 'sustainable development' was created and some remind the most widely accepted and adopted in discussion worldwide.

The most common definition of 'sustainable development' nowadays was published in 1987 by The Brundtland Commission, or formally known as the World Commission on Environment and Development (WCED), set up by the United Nations General Assembly. In its report, sustainable development was defined as "development which meets the needs of the present without compromising the ability of the future generations to meet their own needs and aspirations" (World Commission on Environment and Development., 1987)[13].

The definition was augmented by the Green Paper on the Urban Environment published by the European Commission in 1990, which highlights functional, social, economic and environmental problems of today's cities and puts forward objectives and directives toward achieving a more sustainable urban environment (E. H. W. Chan & Yung, 2004)[14].

[13] World Commission on Environment and Development. (1987). *Our common future*. Oxford: Oxford University Press.
[14] Chan, E. H. W., & Yung, E. H. K. (2004). Is the development control legal framework conducive to a sustainable dense urban development in Hong Kong? *Habitat International, 28*(3), 409-426

The definition of 'sustainable development' formulated by the WCED may be criticised as there is a contradiction in interpreting the concept in the context of built environment, because all developments involve permanent and irreversible change of the nature (Mackley, 2002)[15]. To solve the conflict between the development of the built environment and the reservation of the natural environment, it is important to stress that "the goal of sustainable development is to balance economic progress and environmental conservation." (Langston, 1996)[16] Economist Herman Daly also emphasizes the concept of environmental carrying capacity in stating that "sustainable development means qualitative improvement without quantitative growth beyond the point where the ecosystem cannot regenerate". (Greider, 1998)[17]

Sustainable development does not focus solely on environmental issues. In June 1992, at the United Nations Earth Summit in Rio de Janeiro (the RIO Summit), 179 countries adopted a consensus agreement, which can specifically be called the 'Agenda 21', called for global sustainable development. Sustainable development for local regions has been defined as "…development that delivers basic environmental, social, and economic services to all, without threatening the

[15] Mackley, C. J. (2002). Economics of Sustainable Building. *Royal Australian Institute of Architects Environmental Design Guide* (February 2002).
[16] Langston, C. (1996). Life-cost Studies. Royal Australian Institute of Architects Environmental Design Guide(November 1996), 1-8.
[17] Greider, W. (1998). *One world, ready or not: the manic logic of global capitalism*. London: Penguin Books.

viability of the ecological and community services upon which these services depend" (Guy & Kibert, 1998)[18].

The abovementioned viewpoint on the context of sustainable development was reinforced by the 2005 United Nations World Summit Outcome Document, referring to the "interdependent and mutually reinforcing pillars" of sustainable development as economic development, social development, and environmental protection(United Nations., 2005)[19].

With the environmental, social and economic dimensions of sustainable development, it embraces all facets of human activity, such as industry, transportation and food production etc., and spans local actions through to redressing the major inequities that exist between developed and developing nations. (Cole, 1999) [20] explains that "given the political and economic interdependencies wherein the actions of one nation profoundly affect others, the notion of 'sustainability' is perhaps only meaningful when applied at a global scale."

[18] Guy, G. B., & Kibert, C. J. (1998). Developing indicators of sustainability: US experience. *Building Research & Information, 26*(1), 39-45.
[19] United Nations. (2005). General Assembly. Accessible at www.un-ngls.org/un-summit-FINAL-DOC.pdf. Retrieved 1st February 2008
[20] Cole, R. J. (2005). Building environmental assessment methods: redefining intentions and roles. *Building Research and Information, 33*(5), 455-467

2.4 Sustainable development for Hong Kong

Hong Kong is among the number of active and enthusiastic parties to join the world movement of 'sustainable development' discussion. Based on the major principles of the abovementioned 'Agenda 21', the Hong Kong government is engaged in a process of policy development to identify the goals and mechanisms for the implementation of economically, socially, and environmentally acceptable sustainable development in Hong Kong. (E. H. W. Chan & Yung, 2004)

In a study carried out by the Hong Kong Government entitled 'The Study on Sustainable Development for the 21st century in Hong Kong (SUSDEV21)', it is stressed that "it was particularly important to reflect the distinctive economic, social and environmental influences on sustainable development in Hong Kong". As such, it gives the definition of 'sustainable development in Hong Kong' as "balances social, economic, environmental and resource needs, both for present and future generations, simultaneously achieving a vibrant economy, social progress and a high quality environment, locally, nationally and internationally, through the efforts of the community and the Government" (Planning Department., 2000)[21]. Further detailed indicators and goals of sustainability in terms of economy, health and hygiene, natural resources, society and social

[21] Planning Department. (2000). *The study on sustainable development for the 21st century: Final Report*. Hong Kong: Government Printer.

infrastructure, biodiversity, leisure and cultural vibrancy, environmental quality and mobility were given in the Study.

However, the concept of sustainability in the SUSDEV 21 Study remains largely a theoretical construct. Exactly how the objectives of sustainability will be implement in the practical sense is yet to be further studied and debated. The Study was actually a preliminary focus on promoting public discussion of sustainable development rather than developing an actual strategy for its implementation (Planning Department., 2000). The set of sustainable development criteria for the 21st century have yet to be tested to be the most appropriate and responsive to the local context of Hong Kong. (E. H. W. Chan & Yung, 2004)

In the context of the city's sub-tropical climate and dense high-rise development, the Hong Kong Building Environmental Assessment Method Society (HK-BEAM Society) considers the working definition of 'sustainable building' as "one that is, in priority order, safe, healthy, comfortable, functional and efficient" (HK-BEAM Society., 2004)[22].

[22] HK-BEAM Society. (2004). *HK-BEAM 4/04 'New Buildings': An Environmental Assessment for New Buildings Version 4/04*. Hong Kong: Business Environment Council.

2.5 Definition of green buildings

With the increasing concern to the level of sustainability of the living environment, it is inevitable that constructing environmentally friendly buildings becomes the trend in the construction industry nowadays. These buildings are generally called ‘sustainable buildings’ or ‘green buildings’. While there are in fact differences between the concepts of ‘sustainable buildings’ and ‘green buildings’, particularly ‘green buildings’ prioritises concern to the environmental aspect over economic and social considerations, it is understood that incorporating green features into building design can help to minimise the adverse impact of the building to the surrounding environment during its construction, occupancy and demolition stage.

As (Cole, 1999) suggests, green building design guidelines are typically structured to offer direction on how to improve upon current design practices and only implicitly acknowledge sustainability as a goal. There is an assumption that by continually improving the environmental performance of individual buildings, for example the collective reduction in resource use and ecological loadings by the construction industry, those green buildings will be sufficient to fully address the environmental agenda and achieve an overall state of sustainability in the built environment. Furthermore, the demanding performance of ‘green buildings’ can be progressively increased towards sustainability as ‘green’ design matures. As Figures 2 and 3 show, while a ‘green building’ may not necessarily achieve

the state of sustainability at the very beginning, it is in a progress that implicitly acknowledges sustainability as a goal.

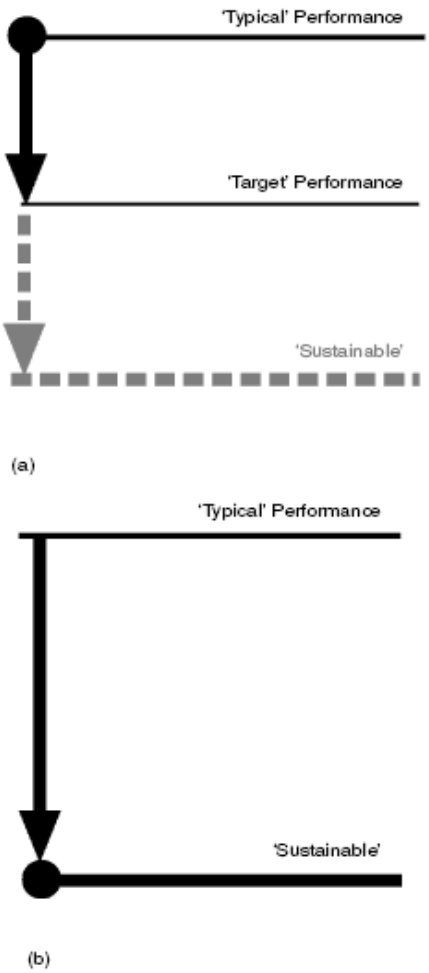

Figure 2 The different between (a) 'green buildings' and (b) 'sustainable buildings' (Cole, 1999)

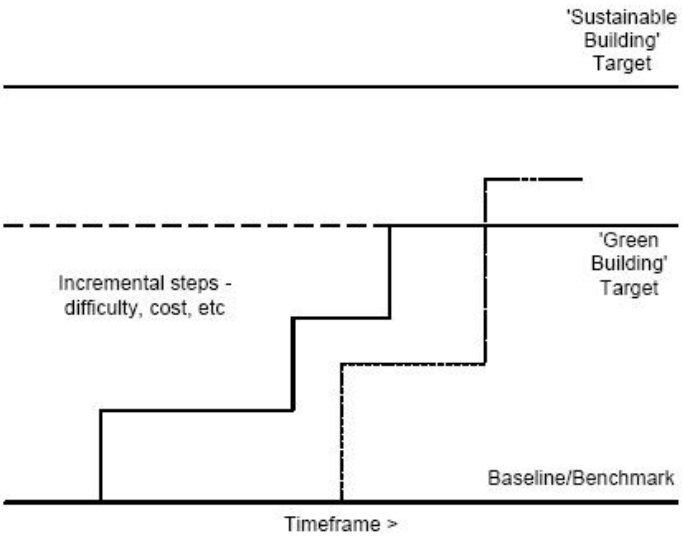

Figure 3 Incremental performance of 'green building' towards sustainability (HK-BEAM Society, 2004)

On the other hand, it was presented in the previous section that the discussion of ‘sustainability’ is more appropriate and meaningful in a global scale than a local scale. On the contrary, it is somewhat more difficult to define specific ‘sustainability’ goals for individual buildings. The ‘individual’ building is a too constraining level to define `sustainable’ practice unless the links between ‘building’ performance and larger scales such as community are acknowledged (Cole, 1999).Therefore, to design and compare buildings regarding to their environmental performance and impact to the surrounding, employing the concept of ‘green buildings’ may be more helpful and appropriate than the concept of ‘sustainable buildings’.

The definition of 'green buildings' varies in different literatures and building assessment schemes and there is not yet a worldwide adopted definition. The American Society for Testing and Materials (ASTM) International defines 'green buildings' as "structures including all types of residential, industrial and commercial that are designed, constructed, renovated and demolished in an environmentally sensitive and responsible manner" and as "a building that provides the specified building performance requirements while minimizing disturbance to and improving the functioning of local, regional, and global ecosystems both during and after its construction and specified service life." It provides furthermore that "a green building optimises efficiencies in resource management and operational performance; and, minimises risks to human health and the environment" (American Society for Testing and Materials International., 2001) [23] . The definition represents a high level of expectation on the environmental, economic and structural performance of 'green buildings', and is applicable throughout the entire life cycle of the building.

There are other definitions of 'green buildings', such as the "use of various resources in a way which does not prejudice the health of people, plants, animals and the environment," and "buildings which by an integrated and holistic approach to location, sitting, design, specification and use of energy and resources, seeking to minimize their environmental impact" (Johnsons, 1993)[24].

[23] American Society for Testing and Materials International. (2001). *E2114-01 Standard Terminology for Sustainability Relative to the Performance of Buildings*.
[24] Johnsons, S. (1993). *Green Building*. London: The Macmillan Press Limited.

2.6 Green buildings development in Hong Kong

Hong Kong, just as the rest of the world, has started developing her consciousness on the issue of sustainable development. The trend of the construction sector here is to build more green buildings. At the same time, the standard of environmental protection has evolved from plantation of flowers and trees in the garden to a scientific and systematic assessment scheme to evaluate the environmental performance of the whole property development.

In Hong Kong, the pioneer environmental rating scheme for buildings is the Hong Kong Building Environmental Assessment Method (HK-BEAM). Launched in 1996 by the non-profit HK-BEAM Society, the scheme is initiated to measure, improve, certify and label the whole-life environmental sustainability of both new and existing buildings.

The purposes of the HK-BEAM are to: (HK-BEAM Society., 2004)

1. enhance the quality of buildings in Hong Kong;
2. stimulate demand for buildings that are more sustainable, giving recognition for improved performance and minimizing false claims;
3. provide a comprehensive set of performance standards that can be pursued by developers and owners;
4. reduce the environmental impacts of buildings throughout their life cycle; and

5. ensure that environmental considerations are integrated right from the onset rather than retrospectively.

HK-BEAM is a holistic rating scheme that defines over 100 best practice environmental criteria on the key aspects of Hong Kong's buildings across the planning, design, construction, commissioning, operation, management and maintenance process. These criteria are categorised into six aspects of Site Aspects, Materials Aspects, Energy Use, Water Use, Indoor Environmental Quality and Innovations and Additions. Assessment on a building will result in a HK-BEAM certificate and rating of Bronze, Silver, Gold or Platinum, according to its performance. Advice and guidance to improve performance are also provided to owners, designers, builders and operators throughout the assessment process.

While being voluntary in nature, the successful scheme is already adopted by more than 140 projects as of March 2008[25]. Both the public and private sectors are keen on the scheme, and a wide range of uses such as domestic, offices, hotels, institutional and transportation are included in the family. Moreover, the scheme has started to reach out to cities in China in recent years. Innovative features for environmental protection can often be found in those rated projects. Examples of such features include the naturally ventilated carpark at Parcville

[25] Email enquiry with the Secretariat for the BEAM Society on 13 Mar 2008

Residential Complex and Building Integrated Photo Voltaic panels at 1 Peking Commercial Building and Hong Kong Science Park (HK-BEAM Society., 2005)[26].

The success of the scheme illustrates property developers' belief that obtaining a rating for their buildings can boost their brand image and increase the value of the buildings. It also demonstrates the trend of green buildings development in Hong Kong.

[26] HK-BEAM Society. (2005). *Enhancing Hong Kong's built environment*. Hong Kong: HK-BEAM Society

Chapter Three

Government Policies in Green Buildings Development

3.1 Introduction

In respond to the increasing consciousness on environmental protection and development sustainability in the construction sector, the Government of Hong Kong has from time to time execute various policy to require the industry to take prescriptive minimum measures to protect the environment, and encourage the industry to take further actions. In this chapter, some of the government policies related to environmental protection and green buildings development will be introduced.

3.2 Legal framework of development control

The basic legal framework of the government's development control in Hong Kong consists of three key elements, namely government land lease control, planning control and building control (Lai, Ho, & Leung, 2004). Some may also

consider environmental control as the fourth element of the legal framework (H. W. E. Chan, 1998).

In land leases, conditions concerning the uses, maximum allowable GFA, and development period and so on are set out for a project site. Under the Town Planning Ordinance, urban development is controlled through the use of statutory outline zoning plans (OZP), restricting the uses and density of development. Furthermore, development potential of a site is controlled by the plot ratio, site coverage, and GFA provisions under the celebrative effect of the land lease, the Town Planning Ordinance and the Buildings Ordinance. Failure to comply with these three means of control may result in the Government's enforcement actions, such as re-entry of land and demolition order. The Environmental Impact Assessment Ordinance aims to control development projects in Hong Kong at a macro level so as to minimise its adverse impact to the natural environmental, especially in undeveloped rural areas.

3.3 Building (Energy Efficiency) Regulations

The Building (Energy Efficiency) Regulations (Cap 123M) is one of the earliest government policy in the field of green buildings development in Hong Kong, coming into effect on 21 July 1995. An overall thermal transfer value (OTTV), a measure of the energy consumption of a building envelope which represents the amount of heat transfer through it, is prescribed to all hotels and commercial

buildings. The policy aims at reducing heat transfer through building envelope thus saving the electricity consumption for air-conditioning. It ensures that design and construction of the buildings investigated will meet a certain requirement of environmental protection. Failure to comply with the prescriptive OTTV may result in disapproval of the building plans or refusal of issue of occupation permit.

3.4 Building (Refuse Storage and Material Recovery Chambers and Refuse Chutes) Regulations

Domestic solid wastes are produced in buildings everyday. The disposal and temporary storage of refuse in buildings until collection are facilitated by refuse chutes, refuse hopper rooms and refuse storage chambers in each building. The areas of these facilities are disregarded from GFA calculation under the Building (Planning) Regulations (Cap 123F)[27].

Although there is a growing concern on solid waste management, the major means of solid waste disposal in Hong Kong is still by landfills. Not only does it consume a huge quantity of land resources, but also represent a waste on potentially recoverable materials. The low rate of reusable and recyclable materials recovery in the Hong Kong domestic waste is blamed upon the insufficient space for the separation and storage of such materials in most buildings to permit recovery.

[27] Building (Planning) Regulations (Cap 123F), Regulation 23(3)(b).

In face of the problem and to encourage recycling of materials, the Building (Refuse Storage Chambers and Chutes) Regulations (Cap 123H) were revised and came into effect in June 2000 to provide for space in buildings for material recovery. The regulations aim at providing an additional storage space in buildings to allow for the separation and accumulation of recovered materials to make wastes recovery profitable and sustainable. The provision of refuse storage chambers, material recovery chambers and requirement on mechanical ventilation and air-purifying facilities for the relevant rooms and chambers are desirable to improve the standard and quality of the building.

Similar to the Building (Energy Efficiency) Regulations, these regulations are also a mandatory legislation aims at promoting a greener environment. They are applicable to all types of building attaining a certain usable floor space.

3.5 Incentives to Promote the Concept of Green Buildings

In July 2000, a task force within the Buildings Department called the 'Building Innovation Unit' was set up to promote the concept of green buildings and to put forward initiatives to encourage the design and construction of buildings with the following features: (Buildings Department., 2001)[28]

[28] Buildings Department. (2001). *Controlling Officer's Environmental Report 2000*. Hong Kong: Government Printer.

1. Adopting a holistic life cycle approach to planning, design, construction and maintenance;
2. Maximizing the use of natural renewable resources and recycled/green building materials;
3. Minimizing the consumption of energy, in particular those non-renewable types; and
4. Reducing construction and demolition waste.

3.5.1 Joint Practice Note Number 1

Subsequently, one year later in 27 February 2001, the first joint practice note to encourage the adoption of green features in buildings was issued by the Buildings Department in collaboration with the Planning Department and the Lands Department, with the above objectives in mind (Buildings Department., 2002)[29]. Incentives, in the form of exemption from calculation of GFA or site coverage, were provided for the construction of seven categories of environmentally friendly features, namely balconies, wider common corridors and lift lobbies, communal sky gardens, communal podium gardens, acoustic fins, sunshades and reflectors, and wing walls, wind catchers and wind funnels

[29] Buildings Department. (2002). *Controlling Officer's Environmental Report 2001*. Hong Kong: Government Printer.

(Buildings Department., Lands Department., & Planning Department., 2001)[30]. For each of these green features, certain criteria and conditions for the exemption of GFA and site coverage calculation are given. For example, there are seven exemption criteria for the green feature balcony. They are:

1. Only applicable to residential buildings;
2. Location of the balcony is restricted to the living room, dining room and bedroom;
3. The balcony does not replace bay window design but provide a further design option. However if both a bay window and a balcony have been proposed within the same room, the balcony will be GFA/SC accountable;
4. The balcony is open on at least 2 sides;
5. It does not project beyond the lot boundary;
6. The summation of areas to be exempted for such balconies including portion of such balconies per residential unit is 2m² or 4% of the Usable Floor Space of the unit whichever is the greater subject to a maximum of 5 m²; and
7. Any balcony to be exempted from GFA / SC either wholly or partially is equal to or not less than $2m^2$.

[30] Buildings Department, Lands Department, & Planning Department. (2001). *Joint Practice Note Number 1 on Concessions for Green and Innovation Facilities*. Hong Kong: Buildings Department, Lands Department and Planning Department.

3.5.2 Joint Practice Note Number 2

Following the success of the first joint practice note, the second joint practice note of incentives for the promotion of green buildings was issued by the three Departments in February 2002 (Buildings Department., 2003)[31]. Five more categories of environmentally friendly features, namely communal sky gardens in non-domestic buildings, precast external walls, utility platforms, mail delivery rooms and noise barriers are included in the incentive scheme (Buildings Department., Lands Department., & Planning Department., 2002)[32]. Similar to those green features in the first package, certain criteria and conditions for the exemption of GFA and site coverage calculation are also given. For example, nine exemption criteria are listed for utility platforms. They are:

1. Only applicable to residential buildings;
2. The maximum area to be exempted for such platform including portion of such platform per residential unit is 1.5m^2;
3. It faces a well ventilated space for clothes drying purpose;
4. It is open on at least two sides or one long side if the utility platform is combined with an air conditioning platform for the same residential unit, or with another utility platform. In the latter case, any separation between the

[31] Buildings Department. (2003). *Controlling Officer's Environmental Report 2002*. Hong Kong: Government Printer.
[32] Buildings Department., Lands Department., & Planning Department. (2002). *Joint Practice Note Number 2 on Concessions for Green and Innovation Facilities*. Hong Kong: Buildings Department, Lands Department and Planning Department.

different uses, if provided, is of parapet height only. The utility platform is not allowed to combine with any balcony in the same unit;

5. It is not located in a light well;
6. It does not adversely affect the natural lighting and ventilation provisions to other habitable space including kitchen;
7. It does not project beyond the lot boundary;
8. There is a minimum of 150mm drop in level from the adjacent interior space; and
9. Parapets are of open design such as railing, perforated sheet or mesh so as not to block natural ventilation.

In addition, a cap of eight percent of the total permitted GFA is applicable to the cumulative GFA exemption for the green features of balconies, wider common corridors and lift lobbies, acoustic fins, sunshades and reflectors, wing walls, wind catchers and wind funnels and mail delivery room with mailboxes in a development, in order contain the effect on the building bulk resulting from the provision of these incentives. Furthermore, the provision of balconies, precast external walls and utility platforms, a premium for lease modification may be payable.

3.5.3 Effectiveness of the Incentives Policy

Since the issue of the first joint practice note in 2001 and the second one in 2002 till the end of 2006, a total of 329 building projects with one or more green features were approved by the Buildings Department (Buildings Department., 2007)[33]. Of all green features included in the incentives scheme, the provision of balconies and utility platforms, such as those shown in Figure 4 below, has always been the most popular among property developers[34]. A possible explanation to the phenomenon may lie in the fact that they can be included in a unit for the sole enjoyment of the unit's occupiers. Property buyers welcome the features as they provide additional floor space, attracting property developers to build them for direct extra profit.

[33] Buildings Department. (2007). *Controlling Officer's Environmental Report 2006*. Hong Kong: Government Printer.
[34] South China Morning Post (2006) "*Developers Cashing in on Eco-buildings"*, 13Mar

Figure 4 Provision of Balconies and Utility Platforms (Combined) Under the Incentives Policy

Although property developments with green features provided under the incentives policy are slowly transforming the cityscape of Hong Kong since the implementation of the policy, the policy has nevertheless received much criticism. It is challenged for increasing the building bulk and density; allowing developers to make huge profits by inflating and selling more floor area without paying for it; and being bureaucratic but not green nor innovative.

According to Vincent Ng Wing-shun, a former president of the Hong Kong Institute of Architects, unit sizes have increased between 10 and 20% since the

start of the policy, result in a more crowded city with reduced open space, blocked sunlight and restricted air ventilation.[35]

It is also criticised for including features that are not green, such as mail delivery rooms and wider common corridors and lift lobbies, but not environmentally protective features such as those recycled materials, grey water and efficiency of energy use[36].

Moreover, as the green features are not assessed for its 'greenness' before their provisions are approved, their actual effect on environmental protection is in doubt. For example, Professor Li Yu-guo of the University of Hong Kong commented that sky gardens located below 10/F would facilitate the dispersion of particles in the air and improve the ventilation in the neighbourhood, but a sky garden located at high level can be too windy for occupants to enjoy[37].

[35] South China Morning Post (2007) "*Safe as Houses?"*, 7May
[36] South China Morning Post (2006) "Aim these brickbats at bureaucrats and politicians, not developers", 16Mar
[37] Ming Pao Daily News (2006) "*環保空中花園高而不當 屋署未設高度限制 專家指難改善空氣*", 15May

Chapter Four

METHODOLOGY AND DATA DESCRIPTION

4.1 Introduction

This chapter will introduce the methodology employed in this dissertation, the Hedonic Price Model, to test for the effect on domestic property value, if any, due to the provision of a balcony and/or a utility platform. Hypotheses on the correlations between the provision of balconies and/or utility platforms, their size and orientation and property value will be set for test. The sources and criteria in selecting relevant data set will also be explained in this chapter.

4.2 Multiple Regression Analysis

Multiple regression analysis is the technique specialised in studying the functional relationship between a dependent variable and some independent variables. Based on the assumption that an unknown variable (the dependent variable) can be expressed as a function of some known and measurable variables (the independent variables), the regression model can be expressed as

a mathematic equation demonstrating the correlation between the selected independent variables and the dependent variable. Not only does it indicate the sign of correlation (positive or negative) between the dependent variable and each independent variable, it also shows the magnitude of each correlation. In this dissertation, a member of the multiple regression models, the hedonic price model, will be employed to study the correlation between the provision of balconies and/or utility platforms in residential property developments and property prices.

4.3 Hedonic Price Model

As a heterogeneous good, the value of housing commodities depends on a number of characteristics such as size, age, and location (Chau, Wong, & Yiu, 2004)[38]. To investigate the effect each characteristic, or attribute, has on the value of a housing commodity, the hedonic price model is commonly employed in literatures. Rosen (Rosen, 1974)[39], the pioneer of research of housing prices in Hedonic Price Theory, hypothesized that a housing market can be viewed as the interaction of implicit markets for different housing attributes. With the model, it is possible to utilise regression analysis to derive the implicit price (the hedonic price) of each housing attribute and the contribution of each attribute to the overall price of housing commodities.

[38] Chau, K. W., Wong, S. K., & Yiu, C. Y. (2004). The value of the provision of a balcony in apartments in Hong Kong. *Property Management, 22*(3), 250-264.
[39] Rosen, S. (1974). Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition. *Journal of Political Economy, 82*(1), 34-55.

The housing attributes used are generally classified into:

1. Structural attributes,
2. Location-related attributes, and
3. Neighbourhood attributes.

Structural attributes are the basic housing attributes related to the structure of the property itself. Common examples of structural attributes include size of the whole property or particular components and age of the building when transacted.

Location-related attributes are the location-related characteristics of a property. Common examples of location-related attributes include floor level and view of the property, and its proximity to the Central Business District.

Neighbourhood attributes are related to the socio-economic characteristics and physical nature of the neighbourhood which can impose a vital effect on property market analysis. Common examples of neighbourhood attributes include the provision of social facilities (Mok, Chan, & Cho, 1995)[40], land use pattern of the surrounding, pollution level and the overall economic performance of the place where the property is situated.

[40] Mok, H. M. K., Chan, P. P. K., & Cho, Y. S. (1995). A Hedonic Price Model for Private Properties in Hong Kong. *Journal of Real Estate Finance and Economics, 10*(1), 37-48.

As the Hedonic Price Model suggests that value of housing commodities is a function of the interacted result of the structural, location-related and neighbourhood attributes, it can be mathematically represented by the following equation:

$$P= f(S,L,N)$$

where

P is the price of a housing commodity

S are the structural attributes

L are the location-related attributes

N are the neighbourhood attributes

On the other hand, the Hedonic Price Model also represents an interpretation that the hedonic price of an attribute (T_1) of a set of attributes (T) being defined as $\partial P/\partial T_1$. The partial derivative can be interpreted as the marginal change in the total price of a housing commodity originated from a change in the particular attribute, while all other attributes remains constant. As a result to this interpretation, the above equation of Hedonic Price Model becomes:

$$P = a + \sum b_i S_i + \sum c_i L_i + \sum d_i N_i + \varepsilon$$

where

P is the price of a housing commodity

S_i is the variable representing structural attributes i

L_i is the variable representing location-related attributes i

N_i is the variable representing neighbourhood attributes i

a is the constant term

b_i, c_i, d_i are regression coefficients of the corresponding variables

ε is the stochastic or error term

The regression coefficients b_i, c_i, d_i respectively measure the changes in P with respect to a unit change in the corresponding variables S_i, L_i, N_i, while other attributes are kept constant. In other words, other things being equal, a unit change in attributes S_i, L_i, N_i will result in a change in P in the magnitude of b_i, c_i, d_i respectively. These regression coefficients are therefore the hedonic price coefficients of the corresponding housing attributes, functioning as implicit prices reflecting the value of such attributes on the property. Applying it to this study, the coefficients of the tested item, the provision of balcony and/or utility platform in a residential unit, would be measuring its effect on property prices.

4.4 Dummy Variables

Not all housing attributes that affect the property prices are quantitative and continuous, such as the floor level, area and age of the property. To model those

qualitative housing attributes, which in many cases are significant factors on property prices, it is common in literatures to include dummy variables in hedonic price model analysis. Usually these attributes only possess a binary character such as 'yes' or 'no', and 'available' or 'unavailable'. The dummy variables introduced to represent such qualitative housing attributes will carry a value of '1' if the character is 'yes' or 'available' and a value of '0' if otherwise, and vice versa. Examples of qualitative housing attributes include the type and class of property, etc. (Mok et al., 1995) illustrated the use of dummy variable is studying the effect on property prices with the existence of a sea view; while (Chau & Ng, 1998)[41] used dummy variable to illustrate the effects of improvement in public transportation capacity on residential price gradient.

Besides, dummy variables are also employed in situation where the independent variables cannot be quantified by number. In a research on the positive effect of lucky numbers on property values, (Chau, Ma, & Ho, 2001)[42] used dummy variables to study if the lucky number '8' in a floor number is a valuable housing attribute. Each last digit of a floor level number was assigned a dummy variable to illustrate the positive effect on property values associated with floor numbers that end with '8'.

[41] Chau, K. W., & Ng, F. F. (1998). The Effects of Improvement in Public Transportation Capacity on Residential Price Gradient in Hong Kong. *Journal of Property Valuation, 16*(4), 397-410
[42] Chau, K. W., Ma, V. S. M., & Ho, D. C. W. (2001). The Pricing of 'Luckiness' in the Apartment Market. *Journal of Real Estate Literature, 9*(1), 31-40.

In short, a dummy variable can be included in the hedonic price model whenever there is a housing attribute that may exert explanatory power to the dependent variable, and that the attribute is qualitative or discrete in nature.

4.5 Balconies and Utility Platforms

While utility platforms may be new to property occupiers, balconies are not. They are commonly found in buildings built prior to the 70's when buildings were allowed to project on the pavement upon payment of a 'balcony fee' to the government. They are also found in upper class developments in more prestige areas such as those in Happy Valley and Mid-Levels, as well as in larger units in large residential estates like City One Shatin and Mei Foo Sun Chuen. An example of such balconies is shown in Figure 5 below. Without the exemption of GFA and site coverage calculation, these balconies imply a sacrifice to the enclosed indoors floor area of the unit. Therefore the provision of balconies to small to medium sized residential units is not common in the past.

Figure 5 Balconies and bay windows attached to units in City One Shatin

Various literatures have proved the environmental and economical value of balconies. From an environmental standpoint, Griffiths considers a balcony an integrated "environmental filter" (Chau et al., 2004). Its projected structure can enhance energy efficiency by acting as a sun-shading device, provide a planting space, and mitigate air pollution and traffic noise. Under some favourable situations, a properly designed balcony can provide considerable screening effects in protecting dwellings against road traffic noise in Hong Kong (Li, Lui, Lau, & Chan, 2003)[43]. From a user's perspective, a balcony may provide a panoramic view and a more spacious indoor environment. (Chau et al., 2004) proved that balcony has economic value and a value enhancement effect on

[43] Li, K. M., Lui, W. K., Lau, K. K., & Chan, K. S. (2003). A simple formula for evaluating the acoustic effect of balconies in protecting dwelling against road traffic noise. *Applied Acoustics, 64*, 633-653.

high-rise residential properties because of an improved view and mitigated adverse environmental impacts, such as noise and air pollution from a main road.

However, the above studies are based on residential developments prior to the government's green features incentives policy. As the trend of balcony provision is spreading to small to medium sized residential units under the policy, does balcony carry the same economic value without sacrificing the enclosed indoors floor area of the unit?

4.6 Hypotheses to be tested

There are several subject matters under test in this study. Details of these matters will be transformed into hypotheses, and testified by regression analysis. The following is a list of hypotheses to be tested in this study.

1. the provision of a balcony to a residential unit has a positive effect on its property price
2. the provision of a utility platform to a residential unit has a positive effect on its property price
3. the positive effect on property price is greater when both a balcony and a utility platform is provided to a residential unit, comparing to units with only balconies provided.

4.7 Sources and Selection of Data

4.7.1 The Subject site

The subject site selected to be tested in this study is Hampton Place, a residential property development in Tai Kok Tsui, Kowloon. Built on top of a podium of car parking spaces and clubhouse, there are three blocks of residential buildings within the development. With 6 floors on the podium and 44 floors on the blocks of residential buildings, the development has a total of 50 floors. With 6 to 7 units per floor per block, it provides a total of 880 residential units, ranging from 440 to 513 square feet of saleable area. Figure 6 and 7 below show respectively the appearance and map of Hampton Place, and Table 1 is a summary of information of the residential development.

Hampton Place is selected as the subject site of this study for a number of reasons. Completed in September 2003, it is one of the very early residential developments that are benefited from the Government's two packages of incentives to promote green and innovative buildings. Compared to newer residential developments under the same policy, residents of Hampton Place should be more familiar with the green features provided to them and their actual effect on environmental protection, energy consumption reduction and enjoyment of space and view.

Besides, it is expected that the transaction records of Hampton Place should be reliable to give a significant result in the hedonic price model. The floor plans of different units in Hampton Place is similar except a variation in the provision of balcony and/or utility platform, which are the subjects of the study, and the saleable area of different units vary in a small range. Together with the same location and neighbourhood, the homogenous nature of Hampton Place means that many housing attributes can be ignored from the test. Without undeveloped sites or reclamation project pending for future development in the vicinity, the impact on property prices due to speculation on deterioration of living environment in the future can also be reduced. Together with a relatively active transaction market in the region which makes transaction prices reflect that of fair market prices, it is likely that data drawn will produce a significant result for the analysis.

Figure 6 Photo of Hampton Place, the Subject Site

Figure 7 Map of Hampton Place (Adopted from Town Planning Board[44])

Table 1 Summary of Subject Site

Name of residential development	Hampton Place
Address	11 Hoi Fan Road, Tai Kok Tsui, Kowloon
Date of Completion	2nd September 2003
Number of blocks	3, on top of a podium
Number of floors	58 (without ground floor, 4, 13, 14, 24, 34, 44 and 54 floors)
Actual number of floors	50 (6 floors on podium)

[44] http://www.ozp.tpb.gov.hk/ [Accessed 2 March 2008]

Number of units per floor	7 (Block 1 and Block 3) 6 (Block 6)
Number of units	880
Saleable area of units	440 to 513 square feet

4.7.2 Sources of Data

The data collected for the test of hypotheses are from the following sources:

1. Economic Property Research Centre (EPRC);
2. Hong Kong Property Review and Hong Kong Property Review Monthly Supplement; and
3. Sales brochure of the subject site

Economic Property Research Centre (EPRC) is a charged online database of property transactions. Established in 1991, it stores transaction records registered in the Land Registry and a lot of other information related to different properties, their transaction and the general property market. Transaction information provided by the database includes type, name and address of the property, date of transaction, consideration, gross and net floor area and age of property, etc.

When obtaining data from EPRC, it is essential to note the type of transaction for each record. Those such as Provisional Agreement for Sale and Purchase and assignments are not necessarily transaction agreement. Without screening of the former, duplicated or incomplete property transaction may be included in the data, distorting the result of the test.

Hong Kong Property Review and Hong Kong Property Review Monthly Supplement are respectively yearly and monthly publication by the Rating and Valuation Department. Hong Kong Property Review provides a review of the Hong Kong property market of the past year and a forecast of completions for the near future. Various tables of statistics of the property market, in detailed classification based on type of property, location, size of property and type of activities etc. are also given in the Review. Hong Kong Property Review Monthly Supplement is the monthly update of the statistics. Hong Kong Property Review and its Monthly Supplement are employed in this study to obtain the Private Domestic Price Index (Territory-wide) for Class B Units over the period of observation.

From the sales brochure of the subject site, floor plans, Master Layout Plan and maps are available for the study of its surrounding environment. From these maps and plans, the view attribute of individual property can be estimated. Also available from the sales brochure is information on floor area, as well as the area of bay windows, balcony and utility platform, if any, of each type of units in the

subject site. Plans and maps in the sales brochure are accessible online through the website of the subject site[45] as well as estate agent companies such as Centaline[46]. Maps of the subject site and its surrounding areas are also available online through various website such as the Town Planning Board's Statutory Planning Portal.[47]

4.7.3 Period of Observation

Observation of transaction records will be done to the period between September 2003 and February 2008. All Agreements for Sale and Purchase concerning properties in the subject site signed during this period of observation will be considered as sources of data for the test of hypotheses. Transactions made before the period of observation will not be considered as the Occupation Permit of the subject site was not yet issued by the Buildings Department. The property development is deemed as incomplete. Transactions made at that time are therefore presale of the property units. As purchasers were purchasing a non-existing commodity, they could not base their decision on the actual commodity but only on other related information, including show flats, sales brochures, description of property agents and site visit to the construction site. Nevertheless, their decision may be distorted by fables and their own imagination. Including such transactions to the observation may render the test of hypotheses

[45] http://www.hampton-place.com.hk [Accessed 23 February 2008]
[46] http://www.centadata.com/phome.aspx [Accessed 2 March 2008]
[47] http://www.ozp.tpb.gov.hk/ [Accessed 2 March 2008]

inaccurate. On the other hand, transactions made after the period of observation will also not be considered. It is due to the fact that the Private Domestic Price Index issued by the Rating and Valuation Department is not yet available.

4.8 Variables in Regression Model

While there may be an endless list of housing attributes that may exert an effect to the value of a housing commodity, it is important to restrict the number of housing attributes and select the most appropriate ones to be incorporated into the hedonic price model. Otherwise, it may be too costly to assemble all necessary data yet some of them may be of poor quality, distorting the result of the model. Even if all the required data are available and of quality, the intrinsic clustering of various housing attributes may lead to the problem of collinearity and make it hard to interpret the substantive meaning of the regression coefficients (Butler, 1982; Fellows & Liu, 2002)[48,49]. Below is a list of variables that are considered most relevant to the study, the effect on property prices due to the provision of a balcony and/or a utility platform in a residential unit. The expected sign of each independent variable on the effect of property prices will also be predicted.

[48] Butler, R. V. (1982). The Specification of Hedonic Indexes for Urban Housing. *Land Economics, 58*, 96-108
[49] Fellows, R., & Liu, A. (2002). *Research methods for construction* (2nd ed.). Malden, Mass.: Blackwell Science.

4.8.1 Dependent Variable

NP Nominal Unit Rate

Nominal unit rate is the recorded property consideration per unit saleable area at the date of transaction. The dependent variable is employed to test the increase in property value, if any, attributable to the provision of a balcony and/or a utility platform in a domestic unit.

4.8.2 Independent Variables

Continuous Variables:

SIZE Saleable Area

Measured in square feet, saleable area of a domestic unit is the floor area exclusively allocated to the unit including balconies but not common areas. It is measured "from the outside of the exterior enclosing walls of the unit and the middle of the party walls between two units. Bay windows, yards, gardens, terraces, flat roofs, carports and the like are excluded from the area" (Rating and Valuation Department., 2007)[50]. For a purchaser, saleable area is the area which he can own and utilise, making it a more relevant attribute of

[50] Rating and Valuation Department. (2007). *Hong Kong Property Review 2007*. Hong Kong: Government Printer

property price compared to GFA which includes common areas. As an increased size of a property gives a more spacious feeling to the occupiers, the coefficient of **SIZE** is therefore expected to be positive.

SIZE^2 Square of Saleable Area

The effect of an additional property size is expected to show a diminishing trend as the size increases. It is because an extra unit of saleable area may make a small to medium sized property more spacious, its effect will be less significant to larger properties though. Therefore, the coefficient of **SIZE^2** is expected to be negative, opposite to that of **SIZE**.

FLOOR Floor Level

Floor level is the number of storeys above ground level on which the property is located. As a densely populated city, most of the buildings in the urban area of Hong Kong are skyscrapers with multiple units stacking up on the same standing ground on different levels. There is no exception in the subject site of the study. It is worth mentioning that as several figures (e.g. 14, 24 etc.) are excluded from the numbering of floor of the subject site of this study, the variants of **FLOOR** cannot be directly adopted from the address of the property. Instead, adjustment of the data has to be done first

to reflect the actual number of storeys above ground level on which the property is located. Since properties on upper floors enjoy further views and less noise and air pollution produced by the traffic on street level, purchasers would prefer them to properties on lower levels. Therefore the coefficient of **FLOOR** is expected to be positive.

FLOOR^2 Square of Floor Level

Similar to the **SIZE** attribute, a diminishing effect of higher floor level is expected. Higher up the building, the advantage of it on property value will decrease. So the coefficient of **FLOOR ^{2}** is expected to be negative, opposite to that of **FLOOR**.

AGE Age

Age is the measure of how old the property was the day when the Agreement for Sale and Purchase was signed. It is the period between the date of the transaction (when the Agreement for Sale and Purchase was signed) and the date of building completion (when the Occupation Permit of the development was issued by the Buildings Department), calculated in months. The larger the value of **AGE** the older the property is when transacted. Due to depreciation of building structure and increasing repair costs over time, it is expected that property value will decrease over time as purchasers would prefer newer units to older ones. The coefficient of **AGE** is

therefore expected to be negative.

AGE^2 Square of Age

Similar to the **SIZE** and **FLOOR** attributes, a diminishing effect of ageing is expected. The rate of decline in property value will decrease as the age of the property increases. The coefficient of **AGE^2** is expected to be positive, opposite to that of **AGE**.

BWAREA Area of Bay Windows

Although the area of bay windows of a residential unit is excluded from the calculation of saleable area (**SIZE**) from its definition, it is nevertheless area which a property occupier can own and utilise. Moreover, it is not uncommon for land developers to include it in the saleable area of a property in sales brochures. For instant, the subject site of this study is an example of such arrangement. Similar to the attribute of **SIZE**, this attribute of **BWAREA** is measured in square feet. As bay windows are areas which property occupiers can use but not acknowledged in the attribute of **SIZE,** the coefficient of **BWAREA** is therefore expected to be positive.

UPAREA Area of Utility Platform

UPAREA is the area of utility platform, if any, included in a property. While its floor area is included in the **SIZE** attribute, the impact of its

existence to property price will be tested by this attribute. Since a variety of area of utility platform (from 9 square feet to 16 square feet, if any) is provided in the subject site, a continuous variable is therefore employed in the test. With a possible reduction in energy consumption associated with the provision of a utility platform, the coefficient of **UPAREA** is therefore expected to be positive.

PDPI Private Domestic Price Index

Price indices are published by Rating and Valuation Department monthly. They are transaction-based records of the property market in Hong Kong which cover a wide variety of property. As the economic condition of Hong Kong, which is an important factor affecting purchasers' consideration when buying a property, has undergone drastic changes over the past years, it is important to reflect such changes in the price model to control over the changes, as well as inflation and other time related factors. For the purpose of this study, the Private Domestic Price Index (Territory-wide) for Class B Units is used, as the units of the subject site fall into this category (units with saleable area of 40 m^2 to 69.9 m^2).

Dummy Variables:

SV Seaview

Seaview is a dummy variable which acknowledge the effect on property prices due to the availability of seaview from a property. The value of **SV** equals one if a property possesses seaview, and zero if otherwise. Because of the enjoyment of a superior view brought by the seaview, the coefficient of **SV** is therefore expected to be positive.

BAL Balcony

Balcony is a dummy variable which acknowledge the effect on property prices due to the provision of a balcony to a property. While the floor area provided by the balcony, if any, is included in the **SIZE** attribute, the impact of its existence to property price will be tested by this attribute. The value of **BAL** equals one if a property possesses a balcony, and zero if otherwise. Since only one size of balcony (22 square feet) is available in the subject site of this study, the variable is therefore modelled as a discrete rather than a continuous one. As suggested in the previous section that balconies have value of a better view and relieved pollution problem, the coefficient of **BAL** is therefore expected to be positive.

4.9 Regression Equations

The aforementioned study conducted by (Chau et al., 2004) will be the functional form of this study. Regression equations of this study will be based on the equations established by (Chau et al., 2004) with modification reflecting the differences between the two studies. In particular, there will only be one dummy variable for the provision of balconies, as the balconies in the subject site, in any, are united in size. Instead of monitoring the effect of a landscaped view and a road view, the effect of possessing a seaview to property prices will be measured in this study. The existence of utility platform will also be acknowledged in this study, and a term on Private Domestic Price Index will be included as well.

As a result to these changes, the major regression equation of this study is:

$$\text{Log}(\mathbf{NP}) = a_0 + a_1\mathbf{SIZE} + a_2\mathbf{SIZE}^2 + a_3\mathbf{FLOOR} + a_4\mathbf{FLOOR}^2 + a_5\mathbf{AGE} + a_6\mathbf{AGE}^2 + a_7\mathbf{BWAREA} + a_8\mathbf{UPAREA} + a_9\mathbf{PDPI} + a_{10}\,\mathbf{SV} + a_{11}\,\mathbf{BAL} + \varepsilon$$

where:

NP is the consideration of the property per unit saleable area at the date of transaction;

SIZE is the saleable area in square feet;

FLOOR is the adjusted floor level of the transacted property;

AGE is the age of the property at the date of transaction in terms of months;

BWAREA is the area of bay windows;

UPAREA is the area of utility platform;

PDPI is the Private Domestic Price Index (Territory-wide) for Class B Units issued by the Rating and Valuation Department;

SV is a dummy variable which will carry a value of one if there is seaview from the unit and zero if otherwise;

BAL is a dummy variable which will carry a value of one if the unit is provided with a balcony and zero if otherwise;

a_1, a_2, a_3 etc. are the coefficients to be estimated;

a_0 is the constant term; and

ε is the stochastic term

Chapter Five

EMPIRICAL RESULTS AND ANALYSIS

5.1 Introduction

In this chapter, the descriptive statistics of the empirical data will be presented first to give an overall picture of the transaction history of the subject site, Hampton Place. It will be followed by the regression result from fitting the data into the hedonic price model established in the previous chapter. Then the hypotheses set in the previous chapter will be tested, and the implications of the results will be analysed and discussed.

5.2 Descriptive Statistics of Data

During the period of observation from September 2003 to February 2008, a total of 806 transaction records are observed. The tables below are the descriptive statistics of several variables mentioned in the regression model in the previous chapter. Table 2 shows the descriptive statistic of some continuous variables. Table 3 demonstrates the occurrence of the two dummy variables.

Table 2 Descriptive statistics of continuous variables

Variables	Minimum	Maximum	Mean	Standard deviation
Nominal price	1,000,000	4,350,000	2,796,488	513,002
NP	2159.93	9886.36	5946.48	1122.92
SIZE	440	513	471.27	19.19
FLOOR	6	50	29.58	13.39
AGE	0	52	21.07	18.00

Table 3 occurrence of dummy variables

Dummy Variables	Occurrence	Percentage of occurrence
SV =1	623	76.43%
BAL =1	660	80.65%
Total number of observation	806	100%

5.3 Interpretation of Empirical Results

Recalling form the previous chapter, the hedonic price model adopted in this study is:

$$\text{Log}(\mathbf{NP}) = a_0 + a_1\mathbf{SIZE} + a_2\mathbf{SIZE}^2 + a_3\mathbf{FLOOR} + a_4\mathbf{FLOOR}^2 + a_5\mathbf{AGE} + a_6\mathbf{AGE}^2 + a_7\mathbf{BWAREA} + a_8\mathbf{UPAREA} + a_9\mathbf{PDPI} + a_{10}\,\mathbf{SV} + a_{11}\,\mathbf{BAL} + \varepsilon$$

Data from transaction records are computed into the model by the software application *EView Version 5.1.* The result is shown below in Table 4:

Table 4 Result of hedonic price model

Dependent Variable: LOG(**NP**)
Method: Least Squares
Included observations: 806 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept***	8.698312	1.977984	4.397564	0.0000
SIZE	-0.001279	0.008308	-0.153884	0.8777
SIZE^2	-1.44E-06	8.76E-06	-0.163793	0.8699
FLOOR **	0.003661	0.001444	2.534502	0.0115
FLOOR^2	-2.32E-05	2.50E-05	-0.925417	0.3550
AGE	0.001548	0.001459	1.061102	0.2890
AGE^2***	-5.98E-05	1.92E-05	-3.120659	0.0019
BWAREA ***	-0.004963	0.001459	-3.402872	0.0007
UPAREA ***	0.005733	0.001390	4.123430	0.0000
PDPI ***	0.009848	0.000778	12.66599	0.0000
SV ***	0.206858	0.010736	19.26849	0.0000
BAL ***	-0.101843	0.036683	-2.776270	0.0056

R-squared	0.693910	F-statistic	163.6372
Adjusted R-squared	0.689670	Prob(F-statistic)	0.000000

***Significant at 1% level, **Significant at 5% level,
*Significant at 10% level

5.3.1 The modified hedonic price model

As the result reveals, the significant levels of some of the variables are unsatisfactory. The result obtained cannot be adopted directly for analysis. The model has to be rearranged to achieve a more satisfactory result by including only the most relevant variables into consideration. After modifying the model by

trial and error, the optimum equation is formed without changing the underlying principle of the hypotheses testing. The new equation becomes:

$$\text{Log}(\mathbf{NP}) = n_0 + n_1\mathbf{SIZE} + n_2\mathbf{FLOOR} + n_3\mathbf{AGE} + n_4\mathbf{BWAREA} + n_5\mathbf{UPAREA} + n_6\mathbf{PDPI} + n_7\,\mathbf{SV} + n_8\,\mathbf{BAL} + \varepsilon$$

where:

NP is the consideration of the property per unit saleable area at the date of transaction;

SIZE is the saleable area in square feet;

FLOOR is the adjusted floor level of the transacted property;

AGE is the age of the property at the date of transaction in terms of months;

BWAREA is the area of bay windows;

UPAREA is the area of Utility Platform;

PDPI is the Private Domestic Price Index (Territory-wide) for Class B

Units issued by the Rating and Valuation Department;

SV is a dummy variable which will carry a value of 1 if there is seaview from the unit and zero if otherwise;

BAL is a dummy variable which will carry a value of 1 if the unit is provided with a balcony and zero if otherwise;

n_1, n_2, n_3 etc. are the coefficients of each variables;

n_0 is the constant term; and

ε is the stochastic term

The result is shown below in Table 5:

Table 5 Result of new hedonic price model

Dependent Variable: LOG(NP)
Method: Least Squares
Included observations: 806 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept***	8.964462	0.182520	49.11485	0.0000
SIZE**	-0.002612	0.000347	-7.536113	0.0000
FLOOR**	0.002386	0.000356	6.711154	0.0000
AGE**	-0.002625	0.000595	-4.412811	0.0000
BWAREA**	-0.005284	0.001421	-3.718590	0.0002
UPAREA**	0.005757	0.001392	4.134764	0.0000
PDPI**	0.011182	0.000656	17.04386	0.0000
SV**	0.208497	0.010492	19.87249	0.0000
BAL**	-0.112104	0.036272	-3.090658	0.0021

R-squared	0.689862	F-statistic	221.6031
Adjusted R-squared	0.686749	Prob(F-statistic)	0.000000

***Significant at 1% level, **Significant at 5% level,
*Significant at 10% level

As the table shows, a more satisfactory result is produced after some independent variables are removed from the equation. The remaining variables all show a high significant level. The coefficient of determination, R^2 is 0.6899. The R^2 indicates that the model with its selected independent variables can explain 69% of the variations in the dependent variable, the nominal unit rate. This is a satisfactory figure for property prices researches, and it implies that these selected independent variables are major determinants of property prices in the Subject Site, Hampton Place.

To form the new equation, the independent variables **SIZE^2**, **FLOOR^2** and **AGE^2** are removed. It implies that the effects on property prices of additional unit saleable area, number of floor level and month of age do not show a significant decreasing rate. Possible reasons behind the phenomenon may be that the housing attributes have small ranges, and significant decreasing rate of their effects have not yet set in. Take the age attribute as an example, with only five years of property age, the decreasing effect of an additional year on age will obviously show a more linear pattern from zero to five years than that of a building considered from 25 to 30 years of age.

5.3.2 Signs of coefficients and their implications

For the signs of the coefficients of each independent variable, the results of **FLOOR**, **AGE**, **UPAREA** and **SV** are in line with the expectation. However, the results of **SIZE**, **BWAREA** and **BAL** show contradiction with the expectation. Table 6 below is a summary of the expected and resulted sign for each independent variable's coefficient.

Table 6 Summary of the expected and resulted sign for each independent variable's coefficient

Independent variable	Expected sign of coefficient	Resulted sign of coefficient
SIZE	+ ve	- ve
FLOOR	+ ve	+ ve
AGE	- ve	- ve
BWAREA	+ ve	- ve
UPAREA	+ ve	+ ve
SV	+ ve	+ ve
BAL	+ ve	- ve

The correct expectation for independent variables **FLOOR**, **AGE** and **SV** show that the assumption on these housing attributes made in the previous chapter are correct. Property purchasers of Hampton Place are attracted to properties on higher floor level and one which possesses a seaview, while repulsed by

properties that are aged. More interesting are the contradictive results of sign of coefficient for independent variables **SIZE** and **BWAREA**. These indicate that property purchasers of Hampton Place do not welcome the additional saleable area and the provision of bay windows in their units. The explanation to this may be due to the similar floor plan and small unit size provided by the residential development.

All units in Hampton Place have a similar floor plan of one bathroom, one kitchen, a living room and a dinning room together with two bedrooms. The difference in floor area of different units is mainly contributed by the provision of bay windows, balconies, utility platforms and 'air conditioner platforms'. Removing these areas from the calculation, the floor area of different units that is entirely surrounded by walls of the unit varies in a very limited fashion (from 422 square feet to 475 square feet). It is difficult for purchasers of Hampton Place to acknowledge the difference between sizes and floor plans of different units. As a result, they will not be willing to offer a substantially larger consideration for a 'known-to-be' larger unit. As the inclement of property prices for larger units cannot keep up with the inclement of saleable area for those units, the property price per unit saleable area therefore decreases as the saleable area increases, contradicting to expectation.

As the case of bay windows, the result indicates that property purchasers of Hampton Place prefer floor area to bay window area. Although bay windows are

excluded from the calculation of saleable area by the government, most property purchasers will put them into consideration for they are buying the unit as a whole. For small units such as those in Hampton Place, it is understandable that property purchasers value every bit of floor area of the unit. Since the usage of bay windows is less flexible compared to the floor as they are elevated from floor level and have reduced headroom, purchasers will place less value on bay window area, especially in small units. Therefore, the provision of bay windows becomes a negative impact on the property price per unit saleable area for Hampton Place, contradicting to expectation.

5.4 Value of provision of balconies

The value of provision of balconies is examined by the dummy variable of **BAL**. Result of the model showed a negative sign of coefficient to the variable, contradicting expectation. It illustrates that the provision of a balcony in the units of Hampton Place has a negative impact on the per saleable area unit rate of property prices. Together with the magnitude of the coefficient, it can be seen that the balcony has caused an 11.21% drop in unit rates for those units that come with a balcony. Although there is on average a 4.94% saleable area gain due to the exemption of GFA calculation under the government's incentives policy, the property prices as a whole still suffer a drop of 6.82% for those units in Hampton Place that are provided with a balcony, not to mention the premium payable for such provision.

Apparently, property purchasers of Hampton Place do not appreciate the provision of balconies in their units, despite the fact that they are approved by literatures as providing a panoramic view and a more spacious environment; and being an 'environmental filter' of noise and air pollution as well as a sunshade for excessive natural lighting. The explanation may again be the small size of the units. While occupiers of large residential units are satisfied with the spacious indoors area of their units and are contented to have a quasi-indoor balcony that is both environmentally friendly and enjoyable for its view and openness, occupiers of smaller units tend to place more value on enclosed indoor area. Similar to the argument for bay windows, the usage of balconies is less flexible than that of the floor. As the balcony is projected from the external wall, activities on it as limited to 'outdoors' one such as placing potted plants, drying clothes, exercising and enjoying the view for a short while, but not 'indoors' uses such as placing furniture. The usage of the balcony is further limited by its small size (22 square feet). Therefore, although in the research by (Chau et al., 2004), it was proved that balconies in Mei Foo Sun Chuen (which has larger units and larger balconies) have a positive value, it is not the case for balconies at Hampton Place.

5.5 Value of provision of utility platforms

The value of provision of utility platforms is examined by the continuous variable of **BWAREA**. Result of the model showed a positive sign of coefficient to the variable as expected. It illustrates that the provision of a utility platform in the units of Hampton Place has a positive impact on the per saleable area unit rate of property prices. Together with the magnitude of the coefficient, it can be seen that for each unit area of utility platform provided to a unit in Hampton Place, a 0.58% increase in unit rates is resulted to those units that come with a utility platform. Together with the increase in saleable area due to the exemption of GFA calculation, the gain in property prices for those unit is even larger. Take the extreme cases at Block 3, middle floors, Flat F as an example, the 16 square feet of utility platform area represent a 3.60% increase in saleable area. Together with the positive effect brought by the utility platform which totals a 9.21% (16 square feet times 0.58% per square feet, rounded off) increase in unit rates, the overall increase in property prices is 13.13% for these units. Even the smallest increase in property prices, which can be seen for units at Block 3, lower floors, Flat A, shows an increase of 7.23%. Compared to the minimal premium payable for the utility platforms, the economic gains to property developers from the provision of such green features are enormous.

Utility platforms are provided mainly for the purpose of natural clothes drying, thus to reduce energy consumption from drying clothes mechanically by gas or electricity. However, is it this clothes drying function that makes utility platforms welcomed by property purchasers? In particular, is it true that property

purchasers of Hampton Place welcome the utility platforms for clothes drying, but not the larger balconies that can perform similar function as well?

5.6 Value of provision of a combined balcony and utility platform

Prior to the revision of Joint Practice Note 2 in February 2006, there were no restrictions to the provision of a combined balcony and utility platform under the green feature incentives policy, and it was usual to see such arrangement in property developments. The subject site of the study, Hampton Place, is also a property development that adopted the arrangement. All utility platforms in Hampton Place are combined with a balcony, but there are still balconies that stand alone, and there are some units without both green features.

In the previous sections, the effects on property prices of units in Hampton Place due to the provision of balconies and utility platforms were calculated. Combining the two figures, the overall effects on property prices due to these green features can be found. More precisely, a case by case approach can be adopted. For each type of units with the same saleable area, area of balcony and area of utility platform, the gain in saleable area, loss in value 'caused by the balcony' and increase in property prices 'caused by the utility platform' are calculated separately first. They are then combined to produce the overall effect on property prices. The results are summarised in the following Figure:

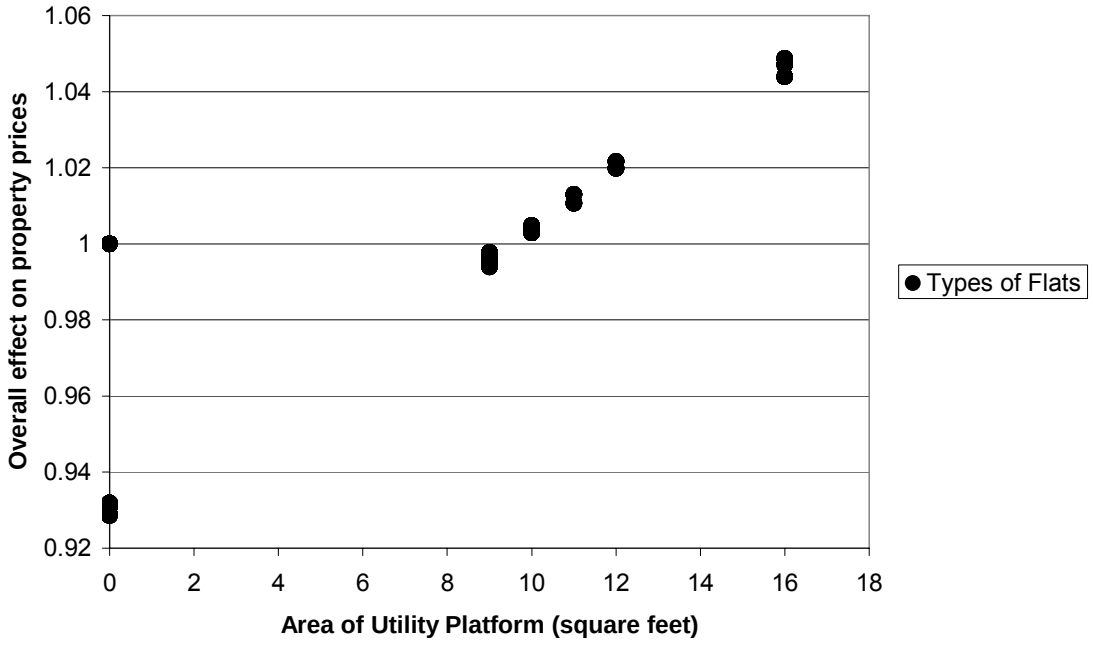

Figure 8 Overall effect on property prices of the provision of balconies and utility platforms in Hampton Place

In Figure 8, the clusters of data represent groups of units that are provided with the same area of utility platforms. Two clusters of data can be found when area of utility platform is zero (utility platforms are not provided). The upper cluster, with an overall effect value at 1, is the benchmark of the price effect, as it represents units provided with neither a balcony nor a utility platform. The lower cluster represents units that are provided with a balconies but not a utility platform. At around 0.93, it shows that the provision of balconies has a negative effect on property prices at around 7%, similar to the result in the previous section. At the right hand side of the figure are clusters of units that are provided with both a balcony and a utility platform. It can be seen that clusters with area of utility platform being 9 is below the benchmark of 1, while other clusters are

above the benchmark. To see a positive effect on property prices, the balcony must be provided together with a utility platform that is larger than 9 square feet. Therefore, the total floor area of the combined balcony and utility platform must be greater than 31 square feet (as all balconies are of 22 square feet) to give a increase to property prices.

5.7 Implication of the results

From the above empirical results, it can be conclude that, the provision of the green features of balconies and utility platforms may contribute a positive effect on property prices. Property purchasers do value the existence of such quasi-indoors/outdoors floor spaces for its enhancement of view and environmental effects (such as filtering pollution, shading excessive sunlight, placing potted plants and drying clothes etc.). However, in order to have the space be utilised effectively, the floor area of it (be it the balcony, utility platform or the combined structure) must be large enough. Otherwise, purchasers will prefer having more enclosed floor space to the exposed structure, especially when the unit is of a small size, and the provision of the green features will exert a negative effect on property prices instead.

Chapter Six

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter will summarise the empirical results from the hedonic price model and their implication on the subject. The significance of the study will be discussed and its limitation will then be identified. Recommendations on areas for further study will be suggested to provide insights in future development of the issue, when time allows researches to be more comprehensive.

6.2 Summary of empirical results

In this study, an equation of hedonic price model was established to study the value of provision of balconies and utility platforms under the government's incentives policy of green features provision. Transaction records of the subject site, Hampton Place, were extracted and analysed with the hedonic prices model.

The empirical results of the hedonic price model shows that the provision of balconies and utility platforms may exert a positive effect on property prices of a residential property development, provided that the structure must be large enough for its effective utilisation. Otherwise, property purchasers will prefer more enclosed floor space for their free use to green features for view enhancement and environment improvement. It is also concluded that the enclosed floor area of a property has an effect on property purchasers' valuation to the provision of the green features.

6.3 Significance of the results

Nowadays, the approval for provision of green features under the government's incentives policy does not subject on the design of the green features nor the property development itself. Only rigid conditions, such as provision to a certain type of land use, limitation of overall size and restriction on the combination of a balcony and a utility platform, are imposed. Such arrangement was claimed to allow more flexible provision of green features to more property developments. However, as the study illustrated, provision of green features is not always economically valuable. The designs of the property as well as the green features are also crucial to the overall effectiveness and environmental improvement of the green features. The results suggest that the government should revise the conditions and criteria for the approval of green features provision, so as to

ensure that all green features provided in property developments are effectively improving the built environment, rather than merely increasing the building bulk.

6.4 Limitation of this study

It is acknowledged that some limitations do exist in the study. To begin with, while the study has established the relationship between the value of the provision of balconies and utility platform, and the size of the unit and the projected structure, there were no evidences to prove such relation since survey was not allowed to be conducted to residents of the subject site. Although the property prices effect due to the provision of the green features was estimated, the underlying reasons for such effect may never be ascertained.

On the other hand, While the incentives policy of green features provision only has a relatively short period of history, the number of property developments encompassed with those green features is still limited. Especially for those green features that are less ‘attractive’ to property developers, such as noise barriers and wing walls, wind catchers and funnels, their adoption in the city can be from nil to just a few. A longer period has to be waited until the green features are more common and start dominating the cityscape. Only by then more observations can be done on different property developments to produce a more accurate value of a green feature, and also more valuation for different green features.

6.5 Recommendations for further study

There are some areas where further studies can be conducted. First, while only the two green features that are mostly adopted and can be privatised by property occupiers were investigated in this study, the other green features listed in the incentives policy should also possess an influence on the built environment. Their provision should therefore exert an effect on property prices, which is worth investigations in further studies in the field as well. Again, it has to be waited until green features are more commonly found, when by then comparison between different property developments in the same area but with different green features become more feasible. The value of each of the green features can be found out separately, as well as the overall effect on property prices with different combination of green features in future studies.

Second, a wider range of housing attributes can be selected in future studies. As the approval of green features provision does not base on the conditions of the property development, they may appear in all sorts of development. For example, while balconies are generally limited to large and prestige units with superior view in the past, they may be provided to small units with undesired view, or at a close proximity that one may look through the balcony into the unit as well. These conditions may affect the value of the green features and become housing

attributes to property prices. Such cases can be identified for specific investigation in future studies.

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APPENDIX I Floor Plan and area of units in Hampton Place

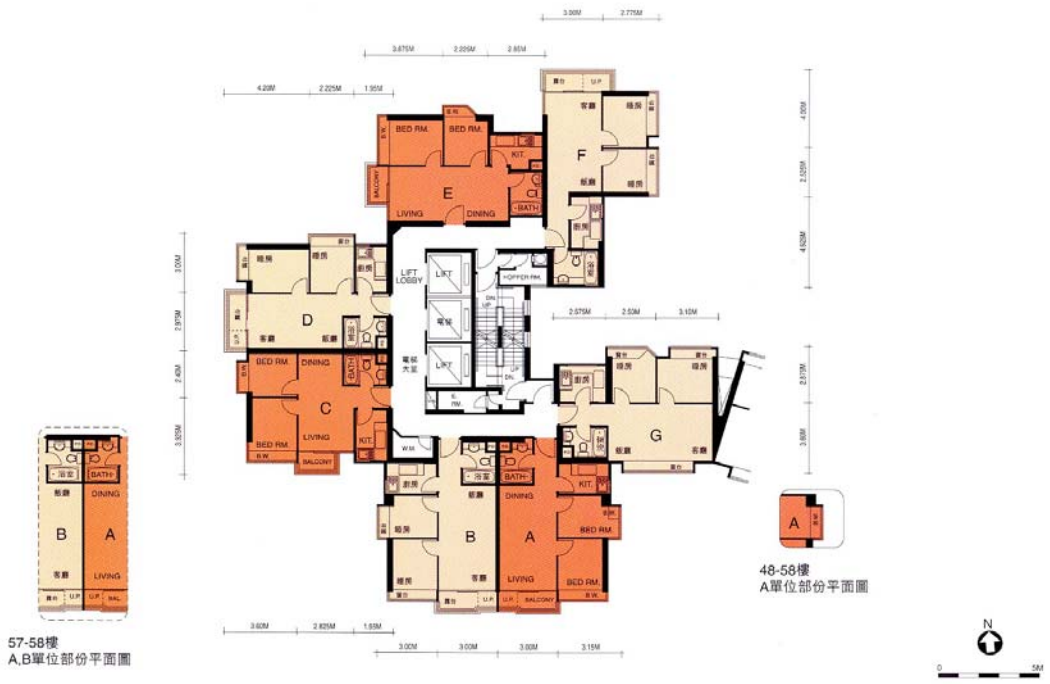


Figure 9 Floor plan of Hampton Place, Block 1

Table 7 Floor area of Hampton Place, Block 1

	8-29/F				31-47/F				48-58/F			
Unit	Saleable Area	B.W. Area	Balcony Area	Utility Platform Area	Saleable Area	B.W. Area	Balcony Area	Utility Platform Area	Saleable Area	B.W. Area	Balcony Area	Utility Platform Area
A	486	17	22	9	486	17	22	9	476	24	452	9
B	484	24	22	9	482	24	22	9	482	24	458	9
C	464	23	22	0	444	23	22	0	444	23	421	0
D	480	17	22	11	464	24	22	11	464	24	440	11
E	480	20	22	0	476	23	22	0	476	23	453	0
F	464	44	0	0	493	27	22	16	493	27	466	16
G	463	43	0	0	463	43	0	0	463	43	420	0

Figure 10 Floor plan of Hampton Place, Block 2

Table 8 Floor area of Hampton Place, Block 2

	8/F				9-47/F				48-58/F			
Unit	Saleable Area	B.W. Area	Balcony Area	Utility Platform Area	Saleable Area	B.W. Area	Balcony Area	Utility Platform Area	Saleable Area	B.W. Area	Balcony Area	Utility Platform Area
A	481	17	22	10	481	17	22	10	471	24	22	10
B	481	17	22	10	481	17	22	10	471	24	22	10
C	440	44	0	0	440	44	0	0	440	44	0	0
D	446	30	0	0	477 (9-45/F) 467 (46-47/F)	17 24	22	10	467	24	22	10
E	442	30	0	0	473 (9-45/F) 463 (46-47/F)	17 24	22	9	463	24	22	9
F	440	44	0	0	440	44	0	16	440	44	0	0

Figure 11 Floor plan of Hampton Place, Block 3

Table 9 Floor area of Hampton Place, Block 3

	8-29/F				31-47/F				48-58/F			
Unit	Saleable Area	B.W. Area	Balcony Area	Utility Platform Area	Saleable Area	B.W. Area	Balcony Area	Utility Platform Area	Saleable Area	B.W. Area	Balcony Area	Utility Platform Area
A	494	17	22	9	482	24	22	9	482	24	22	9
B	486	17	22	9	486	17	22	9	476	24	22	9
C	462	48	0	0	462	48	0	0	462	23	0	0
D	474(8/F) 513 (9-29/F)	41 23	0 22	0 16	513	23	22	16	513	24	22	16
E	470	17	22	12	458	24	22	12	458	23	22	12
F	456	45	0	0	483	27	22	16	483	27	22	16
G	455	17	22	0	445	24	22	0	445	43	22	0

Appendix II Joint Practice Note Number 1 on Concessions for Green and Innovation Facilities

Buildings Department **Lands Department** **Planning Department**

Joint Practice Note No. 1

Green and Innovative Buildings

Introduction

To protect and improve the built and natural environment, the Buildings Department (BD), the Lands Department (LandsD) and the Planning Department (PlanD) promote the construction of green and innovative buildings. The objective is to encourage the design and construction of buildings that encompass the following features:

(a) Adopting a holistic life cycle approach to planning, design, construction and maintenance;

(b) Maximizing the use of natural renewable resources and recycled/green building material;

(c) Minimizing the consumption of energy, in particular those non-renewable types; and

(d) Reducing construction and demolition waste.

2. This is the first of a series of practice notes to be issued jointly by BD, LandsD and PlanD on the subject. The joint practice note sets out the incentives we would provide to encourage the incorporation of these features in building development, and the procedures for application for them under the Buildings Ordinance, the Lease Conditions and the Town Planning Ordinance, where relevant.

Incentives

3. We wish to encourage the industry to explore ways to improve environmental performance during the construction and throughout the life cycle of new buildings by incorporating initially the features in items (a) to (d) in paragraph 1. The first package of incentives which are effective from the issuance of this joint practice note, includes a list of green features that may, subject to the conditions specified in subsequent paragraphs, be exempted from Gross Floor Area (GFA) and Site Coverage (SC) calculations. This list will be continuously reviewed and revised in pace with the ongoing development of green buildings and new incentives to encourage the provision of new green features in buildings.

/Exemption...

Exemption of the First Package of Green and Innovative Features from GFA and SC Calculations

Under Buildings Ordinance

4. The following green features may upon application and subject to conditions be excluded from GFA and/or SC calculations under the Buildings Ordinance:

(a) Balconies;

(b) Wider common corridors and lift lobbies;

(c) Communal sky gardens;

(d) Communal podium gardens;

(e) Acoustic fins;

(f) Sunshades and reflectors;

(g) Wing walls, wind catchers and funnels.

5. Criteria and conditions for exempting the above green features are listed in Appendix A. To contain the effect on the building bulk resulting from the provision of these incentives, the cumulative GFA exemption for all the green features, excluding sky and podium gardens, should not exceed 8% of the total permitted GFA for the development.

6. Subject to compliance with the requirements of the Town Planning Ordinance, the above exemptions under the Buildings Ordinance may be given prior to completion of any lease modification and payment of premium as may be required under lease conditions.

Under Lease Conditions

7. For new leases to be granted, suitable clauses will be inserted allowing LandsD to exempt the features listed at paragraph 4 above from calculation of GFA and/or SC if such leases provide for a maximum GFA and/or SC. LandsD may when allowing the exemption impose additional conditions to ensure that such features will be properly used and maintained.

/8. For …

8. For existing leases with GFA and/or SC restrictions, the features as listed at paragraph 4 above may be exempted from calculation of GFA and/or SC. Where the lease contains a condition restricting the number of storeys or height of the building to be erected on the lot and the feature will cause such restriction to be breached, a lease modification will be required.

9. Balconies will be exempted from calculation of GFA and/or SC only after the completion of a lease modification and subject to payment of premium and an administrative fee. The exemption of wider common corridors and lift lobbies from GFA and/or SC calculation will not require a lease modification. The exemption of features other than balconies and wider common corridors and lift lobbies from GFA and/or SC calculation may have to be covered by a modification letter at nil premium and an appropriate administrative fee. The exemption of sky gardens from GFA calculation at nil premium is only applicable to sites with a recreational clause in the lease. For sites without a recreational clause in the lease, no premium will be charged if the sky gardens are designed for sitting out purpose only without other recreational facilities. LandsD may impose additional conditions to ensure that the exempted features are properly used and maintained.

10. An Authorized Person (AP) is advised to check against the lease conditions to determine whether a lease modification is required. In case of doubt, an enquiry may be directed to the relevant District Lands Office (DLO) of the LandsD and a reply will be given within 30 days. Alternatively, an AP will be informed directly by the DLO within 13 weeks from the receipt of a formal plan submission through the central processing system.

11. For any exemption to be granted under the lease, it is a pre-requisite that such features must first be exempted by the Building Authority. However, to facilitate the preparation of the basic terms and a demand note for the payment of the initial administrative fee, an application for lease modification should be submitted to the DLO in parallel with the submission to BD at the earliest instance. BD will alert DLO as soon as a no-objection-in-principle to the proposed green features is established. Once approval of the building plans exempting such green features have been granted by the Building Authority, an AP is advised to submit a copy of the approved plans together with a copy of the demand note receipt to DLO such that the basic terms may be finalized as soon as possible.

Under Town Planning Ordinance

12. PlanD will adopt the same criteria and conditions for the exemption of the green features from GFA and/or SC calculations as set out in paragraphs 4 and 5 above, subject to there being no contravention with the restrictions on building height and/or SC, if any, stipulated on the Outline Zoning Plan (OZP) / Development Permission Area Plan (DPAP). There may be situations where the GFA exemption may result in an increase in building height and/or SC above that stated on the OZP/DPAP.

/In ...

In such cases, an application to the Town Planning Board (TPB) for minor relaxation (if such a provision is available under the OZP/DPAP) will be required.

13. For development schemes previously approved by the TPB, the incorporation of such green features may result in minor amendments to the approved schemes. In which case, the general requirements as set out in the TPB Guidelines for Minor Amendments to Approved Development Proposals (TPB PG-No.19B) will apply.

14. Enquiries on whether a TPB approval is required or whether an approved scheme needs to be amended as a result of the incorporation of the green features may be directed to the respective District Planning Office of the PlanD.

Application

15. The above incentives are applicable to new projects for which occupation permits have not been issued.

16. For the avoidance of doubt, the amendment set out in paragraph 1 (b)(ii) of Appendix A is applicable to all new plans to be approved on or after 1 February 2005.

Formal Submission and Enquiries on Green Features

17. All formal submissions should be made through the normal channels to BD, LandsD or PlanD as appropriate.

18. Applications for exemption of the green features from GFA or SC calculations under the provisions of the Buildings Ordinance should be made by way of applications for modification with supporting documents and undertaking.

19. Enquiries on any proposed green features for incorporation in a development may be directed to the Building Innovation Unit of the BD.

Misuse of Incentives

20. An occupation permit will not be issued unless there is evidence indicating that the following conditions of exemption have been complied with:

(a) The green features are separately listed in the sales brochure, as detailed in paragraph 2(a) of Appendix A, if the sales of the development takes place before the issuance of an occupation permit; and

(b) The required undertaking as detailed in paragraph 2(b) of Appendix A is registered in the Land Registry.

/21. The ...

21. The government will monitor the use of the features and will take enforcement action, including prosecution, against non-compliance with the following conditions of exemption:

(a) The green features are separately listed in the sales brochure, as detailed in paragraph 2(a) of Appendix A, if the sales of the development takes place after the issuance of an occupation permit;

(b) Balconies are not to be enclosed; or

(c) Skygardens and podium gardens are for the exclusive use of the residents / tenants and their visitors only as detailed in paragraph 2(d) of Appendix A.

22. Developers should remind purchasers of the consequence of any misuse of the above incentives.

(Marco M. H. WU)	(P. L. C. LAU)	(B. C. K. FUNG)
Building Authority	Director of Lands	Director of Planning

Ref.: BD GP/ENV/8
LD 2/1020/00
TPB/C/BLC/2

First issue February 2001
This revision October 2004 (Para. 13 amended, para. 16 added and para. 1(b)(ii) of Appendix A amended)

Index under: BIU
Green Buildings
Incentives for Green Buildings

Criteria and Conditions for Exempting the First Package of Green and Innovative Features from GFA / SC Calculation

1. Specific criteria for exempting the first package of green and innovative features are detailed below. For the avoidance of doubt, application of incentives to residential buildings where described will not apply to the non-domestic portion of a composite building. Furthermore, domestic accommodation for commercial use such as hotels will not be qualified for the concessions.

(a) **Balconies**

The criteria for exempting balconies from GFA and SC calculations are:

(i) Only applicable to residential buildings;
(ii) Location of the balcony is restricted to the living room, dining room and bedroom;
(iii) The balcony does not replace bay window design but provide a further design option. However if both a bay window and a balcony have been proposed within the same room, the balcony will be GFA/SC accountable;
(iv) The balcony is open on at least 2 sides;
(v) It does not project beyond the lot boundary;
(vi) The summation of areas to be exempted for such balconies including portion of such balconies per residential unit is 2m? or 4% of the Usable Floor Space of the unit whichever is the greater subject to a maximum of 5 m? and
(vii) Any balcony to be exempted from GFA / SC either wholly or partially is equal to or not less than 2m?

(b) **Wider common corridors and lift lobbies**

Subject to the condition that the need to provide a wider corridor or lift lobby is not resulting from any statutory requirement, the criteria for exempting such floor areas from GFA and SC calculations are:

(i) Only applicable to floors other than the entrance hall(s) of residential buildings;
(ii) Where not provided with natural ventilation but provided with mechanical ventilation, width of corridor between 1200mm and 1800mm and width of lift lobby between 1650mm and 2200mm may be exempted; and

/(iii) Where…

(iii) Where provided with natural ventilation, width of corridor between 1200mm and 2200mm and width of lift lobby between 1650mm and 2500mm may be exempted.

See Appendix B for guidance on the interpretation of corridors and lift lobbies. The above measurements are based on structural dimensions of the corridors and lift lobbies.

(c) **Communal sky gardens**

The criteria for exempting sky gardens from GFA calculations are:

(i) Only applicable to residential buildings;
(ii) It provides natural ventilation, greenery and recreational garden space for communal use;[1]
(iii) In addition to any podium gardens, the maximum number of sky gardens provided is equal to or less than the number of residential storeys divided by 15. However, such garden may be split into say 2 sky gardens each occupying 50% of the area of the floor plate; or 3 sky gardens each occupying 1/3 of the area of the floor plate;
(iv) The sky garden occupies not less than 1/3 of the area of the floor plate;
(v) Where more than one sky garden is provided and where there is no podium garden, the first sky garden is to be located at not more than 10 storeys above the lowest ground storey for improvement of the microclimate at street level;
(vi) It is accessible from the common area only;
(vii) It has a clear height of not less than 4.5m;
(viii) It is open-sided above safe parapet height on at least two opposite sides to provide cross ventilation;
(ix) Where the garden is coupled with refuge floor, the design complies with the relevant fire codes;
(x) Exhaust from any ventilating system does not face the garden;
(xi) Not less than 25% of the garden area is to be planted with greenery;[2] and
(xii) Maintenance of the garden is financially viable.

Footnotes

1. The effective location and dimensions of a sky garden is recommended to be provided by wind tunnel tests and/or computational fluid dynamics to ensure the most favourable microclimate to the neighbourhood.

2. The use of native trees and shrubs is recommended.

/(d) Communal…

(d) **Communal podium gardens**

The criteria for exempting podium gardens from GFA calculations are:

(i) It is under the footprint of a commercial or industrial tower;
(ii) The floor is for use as podium garden for sitting out purpose only;
(iii) It has a clear height of not less than 4.5m;
(iv) It is open-sided above safe parapet height on at least two opposite sides to provide cross ventilation;
(v) Where cargo/service lifts are provided, the garden is not served by such lifts;
(vi) Exhaust from any ventilating system does not face the garden;
(vii) Not less than 25% of the garden area is to be planted with greenery; [2] and
(vii) Maintenance of the garden is financially viable.

(e) **Acoustic fins**

The criteria for exempting acoustic fins from GFA and SC calculations are:

(i) It mitigates against unwanted or excessive sound and does not project more than 1.5m from the external wall. Oversized fin projecting more than 1.5m would require justification;
(ii) It is not a load bearing element, that is, it does not bear any load other than that due to its own weight and to wind pressure on its own surface; and
(iii) It does not project beyond the lot boundary.

(f) **Sunshades and reflectors**

The criteria for exempting sunshades and reflectors from GFA and SC calculations are:

(i) It improves the energy efficiency of a building and does not project more than 1.5m from the external wall. Oversized sunshade and reflector projecting more than 1.5m would require justification;
(ii) It is not a load bearing element, that is, it does not bear any load other than that due to its own weight and to wind pressure on its own surface; and
(iii) It does not project beyond the lot boundary.

/(g) Wing…

(g) **Wing walls, wind catchers and funnels**

The criteria for exempting wing walls, wind catchers and funnels from GFA and SC calculations are:

(i) It promotes the natural ventilation of a building;
(ii) The wing wall is a fin used to channel wind into the insides of the building and does not project more than 1.5m from the external wall. Oversized wing wall projecting more than 1.5m would require justification;
(iii) The wing wall is not a load bearing element, that is, it does not bear any load other than that due to its own weight and to wind pressure on its own surface;
(iv) The wind catcher captures the cooling breeze and makes deliberate use of buoyancy. The size of the wind catcher to be exempted from GFA and SC calculation will be assessed on a case by case basis with substantiating justification;
(v) Funnel makes use of the building height to facilitate the stack/chimney effect in natural thermo-syphonic ventilation, especially during windless hours. Instances where admitting unmodified hot and humid ambient atmosphere to the interior do not provide comfort nor conserve energy, a combined mechanical and natural ventilation system using stack/chimney effect will be encouraged. The size of the funnel to be exempted from GFA and SC calculation will be assessed on a case by case basis with substantiating justification; and
(vi) It does not project beyond the lot boundary.

2. Upon granting modification to exempt the green features from GFA and/or SC calculations, the Building Authority shall, where appropriate, impose the following conditions:

(a) Where green and innovative features have been exempted from GFA calculation, such items and their use together with a schedule listing the corresponding areas so exempted must be clearly stated in the Sales Brochure. Where they are included in the saleable area of a property, such inclusion shall also be clearly stated in the Sales Brochure. On the day on which the Sales Brochure in respect of the development is made available for collection by the general public, a copy of the brochure shall be deposited with BD for record.

(b) The undertaking required to be submitted in paragraph 18 in support of an application for exemption is to be registered in the Land Registry before the application for an occupation permit is submitted. Such undertaking may include:

/(i) A letter ...

(i) A letter of undertaking from the Developer to separately list all the green features in the Sales Brochure;

(ii) A letter of undertaking from the Developer designating balconies as 'non-enclosed areas' and the sky gardens / podium gardens as 'common areas' in the Deed of Mutual Covenant (DMC) with details of the use and location clearly indicated. Such DMC should contain binding and enforceable conditions for the control, operation, financial support and maintenance for such features.

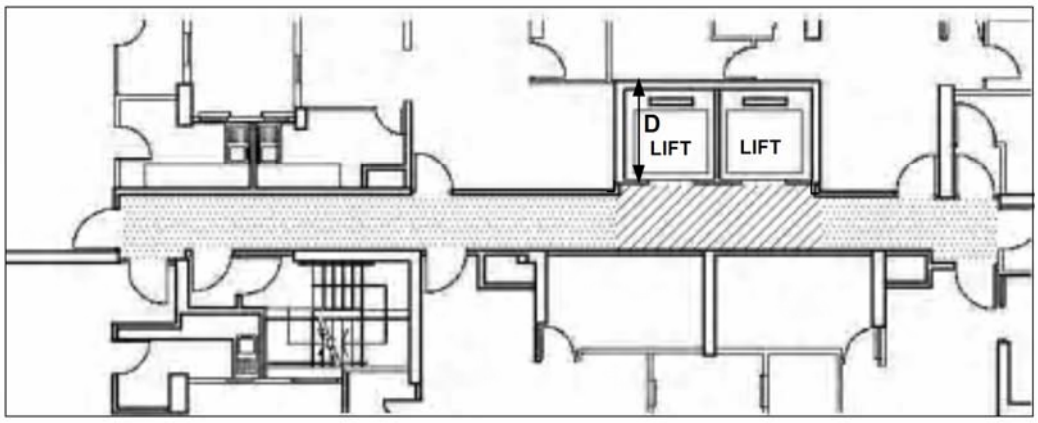
(c) Balconies shall not be enclosed.

(d) Skygardens and podium gardens shall be for the exclusive use of the residents / tenants and their visitors only as indicated on the approved plans and such areas shall not be used for any purpose or by any other persons without the prior consent of the Building Authority.

JPN1 – Appendix A

First issue February 2001
This revision October 2004 (Para. 1(b)(ii) amended)

Appendix B
(JPN1)



straight-lined corridor / lift lobby arrangement

figure 1

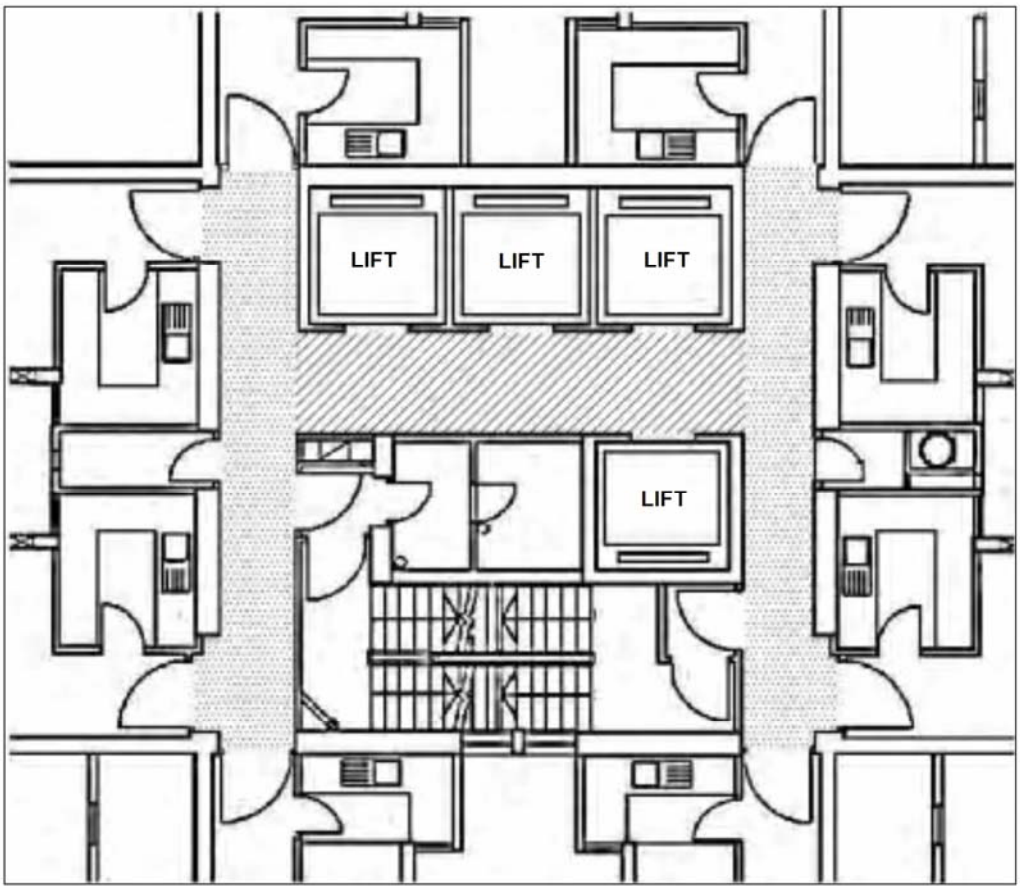
In a straight-lined corridor / lift lobby arrangement, the ift lobby? is the space contained within the core, immediately outside the lift shafts. Where it extends beyond the core walls by a distance which is equivalent to or more than the depth of the lift shaft, such space beyond the core walls will be considered as a orridor?

Legend:

Lift Lobby

Corridor

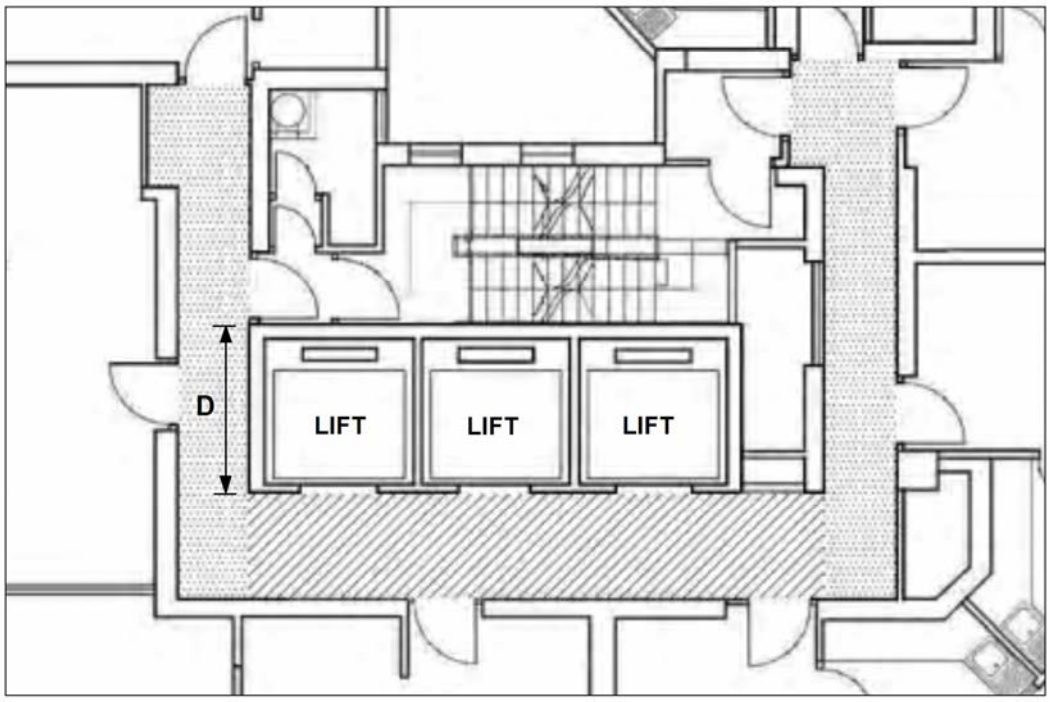
Depth of the lift shaft



H-shaped corridor / lift lobby arrangement

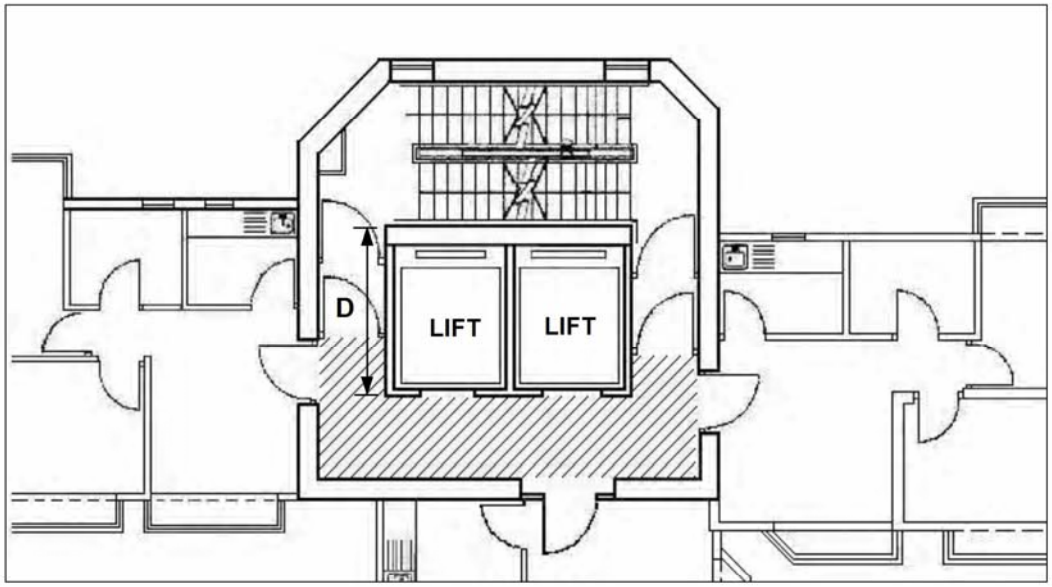
figure 2

In an H-shaped corridor / lift lobby arrangement, the ift lobby? is the space immediately outside the lift shafts and it stops where it meets the orridor? at either ends.



U-shaped corridor / lift lobby arrangement

figure 3



U-shaped corridor / lift lobby arrangement

figure 4

In a U-shaped corridor / lift lobby arrangement, the ift lobby? is the space immediately outside the lift shafts. It may turn directions and extend beyond up to a maximum length which is equivalent to the depth of the lift shaft. If the space extends beyond this depth, it will be considered as a orridor?

Appendix III Joint Practice Note Number 2 on Concessions for Green and Innovation Facilities

Buildings Department **Lands Department** **Planning Department**

Joint Practice Note No. 2

Second Package of Incentives to Promote Green and Innovative Buildings

Introduction

Following the issue of the Joint Practice Note No.1 (JPN1) in February 2001, this is the second of a series of practice notes to be issued to promote the construction of green and innovative buildings. The objective, application and conditions for submission remain unchanged.

Exemption of the Second Package of Green and Innovative Features from GFA and SC Calculations

Under Buildings Ordinance

2. The following green features may upon application and subject to conditions be exempted from Gross Floor Area (GFA) and/or Site Coverage (SC) calculations under the Buildings Ordinance:

(a) Non-structural prefabricated external walls;

(b) Utility platforms;

(c) Mail delivery rooms with mailboxes;

(d) Noise barriers; and

(e) Communal sky gardens for non-residential buildings.

/3. Criteria…

3. Criteria and conditions for exempting the above green features are listed in Appendix A. Prefabricated external walls are similar to curtain walls; utility platforms are similar to air conditioning platforms and noise barriers are not attached to the main tower. As such, only the area of mail delivery room with mailboxes which has been exempted from GFA will need to be included in the calculation of the cumulative GFA exemption and be confined by the 8% cap as stipulated under JPN1. As in JPN1, the provision of sky garden would not be subjected to the 8% GFA cap.

4. Subject to compliance with the requirements of the Town Planning Ordinance, the above exemptions under the Buildings Ordinance may be given prior to completion of any lease modification and payment of premium as may be required under lease conditions.

Under Lease Conditions

5. For new auction and tender sites with GFA and/or SC restrictions, a suitable clause will be included in the Conditions of Sale/Grant allowing the green features mentioned in para. 2(a) to (e) above to be excluded from the calculations of GFA and/or SC, without the payment of a premium.

6. For all other sites including lease modifications, land exchanges and private treaty grants with GFA and/or SC restrictions, LandsD will insert a suitable clause in the new land grant documents allowing the said green features to be excluded from the calculations of GFA and/or SC subject to the charging of premium as set out below: -

(a) Premium will be charged for prefabricated walls based on the gain in usable floor area except those cases where curtain walls are already exempted from GFA calculations in the existing leases. LandsD Practice Note will be issued separately.

(b) Similar to the balconies as promulgated under JPN1, standard premium will be charged for the utility platforms. LandsD Practice Note will be issued separately.

/(c) Nil…

(c) Nil premium will be charged for mail delivery rooms.

(d) Exemption of the noise barrier from GFA and/or SC calculations under the lease may have premium implication. Each case will be examined on an individual basis.

(e) Nil premium will be charged for communal sky garden which will be strictly prohibited from commercial activities pursuant to paragraph 1(e)(iv) of Appendix A.

Under Town Planning Ordinance

7. PlanD will adopt the same criteria and conditions for the exemption of the green features from GFA and/or SC calculations as set out in para. 3 above and Appendix A, subject to there being no contravention with restrictions on building height and/or SC, if any, stipulated on the relevant Outline Zoning Plan (OZP) / Development Permission Area Plan (DPAP). There may be situations where the provision of sky garden may result in building height and/or SC exceeding that permitted under the OZP/DPAP. In such cases, an application to the Town Planning Board for minor relaxation (if such a provision is available under the OZP/DPAP) will be required.

8. Procedures regarding minor amendments to approved schemes and enquiries remain unchanged.

Misuse of Incentives

9. An occupation permit will not be issued unless there is evidence indicating that the following conditions of exemption have been complied with:

(a) The green features are separately listed in the sales brochure, as detailed in paragraph 2(a) of Appendix A, if the sale of the development takes place before the issue of an occupation permit; and

(b) The required undertaking as detailed in paragraph 2(b) of Appendix A is registered in the Land Registry.

/10. The…

10. The government will monitor the use of the features and will take enforcement action, including prosecution, against non-compliance with the following conditions of exemption:

(a) The green features are separately listed in the sales brochure, as detailed in paragraph 2(a) of Appendix A, if the sale of the development takes place after the issue of an occupation permit;

(b) Utility platforms are not to be enclosed above parapet height; or

(c) Sky gardens are for the exclusive use of owners, tenants and their visitors only as detailed in paragraph 2(d) of Appendix A.

11. Developers should remind purchasers of the consequence of any misuse of the above incentives.

Application

12. The amendments set out in paragraph 1(b)(iv) of Appendix A is applicable to all new building plans submitted for approval on or after 1 May 2006.

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Building Authority	Director of Lands	Director of Planning

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LD 2/1020/00
TPB/C/BLC/2

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This revision February 2006 (Para. 12 added and para. 1(b)(iv) of Appendix A amended)

Index under: BIU
Green Buildings
Incentives for Green Buildings

Appendix A (JPN 2)

Criteria and Conditions for Exempting the Second Package of Green and Innovative Features from GFA/SC Calculation

1. Specific criteria for exempting the second package of green and innovative features are detailed below. For the avoidance of doubt, application of incentives to residential buildings where described does not apply to the non-domestic portion of a composite building. Furthermore, residential accommodation for commercial use such as hotels and service apartments does not qualify for the exemption.

(a) **Non-structural Prefabricated External Walls**

Application for exemption of non-structural prefabricated external walls from GFA and SC calculations will be favourably considered where such provision meets the following criteria:

(i) It is non-load bearing and satisfies the design requirements similar to that for curtain walls as stipulated in Building (Construction) Regulations 42 and 43 except for the connections[1];
(ii) The maximum thickness of the wall to be exempted is 300mm;
(iii) It does not project beyond the lot boundary; and
(iv) Prefabricated external walls having prefabricated projecting windows may also be exempted from GFA and SC calculations provided the maximum thickness of the wall to be exempted is 300mm as mentioned in paragraph (a)(ii) above and the design of the projecting windows satisfies the criteria stipulated under PNAP 68. (See illustration at Appendix B)

(b) **Utility Platforms**

Application for exemption of utility platforms from GFA and SC calculations will be favourably considered where such provision meets the following criteria:

(i) Only applicable to residential buildings;

/(ii)....

[1] The prefabricated external walls may be fixed to the load-bearing structure by:
(a) in-situ reinforced concrete joints; or
(b) cast-in anchorage in a structural concrete member; or
(c) being welded to a structural steel member

(ii) The maximum area to be exempted for such platform including portion of such platform per residential unit is 1.5m^2;

(iii) It faces a well ventilated space for clothes drying purpose[2];

(iv) It is open on at least two sides or one long side if the utility platform is combined with an air conditioning platform for the same residential unit, or with another utility platform. In the latter case, any separation between the different uses, if provided, is of parapet height only. The utility platform is not allowed to combine with any balcony in the same unit;

(v) It is not located in a light well[3];

(vi) It does not adversely affect the natural lighting and ventilation provisions to other habitable space including kitchen;

(vii) It does not project beyond the lot boundary;

(viii) There is a minimum of 150mm drop in level from the adjacent interior space; and

(ix) Parapets are of open design such as railing, perforated sheet or mesh so as not to block natural ventilation[4].

(c) **Mail Delivery Rooms with Mailboxes**

Application for exemption of mail delivery rooms with mailboxes from GFA calculation will be favourably considered where such provision meets the following criteria:

(i) Only applicable to residential buildings;

(ii) It is located in a common area of residential buildings and designated as a common area in the Deed of Mutual Covenant; and

(iii) It is not excessive in size. As a general guide, an area of 16m^2 may be allowed for a block size of 320 flats[5].

/For....

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[2] The utility platform may be accessible through a door opening and may be provided with a water supply point and sink. Open air (as defined under Building (Planning) Regulation 2), other than a light well, may be accepted as a well-ventilated space.

[3] A re-entrant with a clear width less than 1500 mm is deemed to be a light well.

[4] Notwithstanding this criterion, the lowermost 400 mm of such parapets can be of solid construction. The overall design must comply with the relevant fire codes and the acceptance criterion is similar to that for a balcony as described in PNAP 260.

[5] Recommended size of mailbox is 100mm x 300mm x 400mm (depth). Recommended width for passage in the mail delivery area is 1200mm. Provision of some form of lighting and ventilation to facilitate delivery service within the mail delivery room is recommended.

For the avoidance of doubt, the area to be exempted may include the mail delivery room and the area occupied by the mailboxes but not the area or room in front of the mailboxes.

(d) **Noise barriers**

Application for exemption of noise barriers from GFA and SC calculations will be favourably considered where such provision meets the following criteria[6]:

(i) It may be a stand-alone wall, with or without projection, and located away from the main tower, or in the form of cantilevered acoustic panel from external walls of the podium;
(ii) Where it projects beyond the lot boundary, approvals from the relevant government departments are given;
(iii) It is not to be used for any commercial purposes, and
(iv) The size to be exempted from GFA and SC calculations will be assessed on a case-by-case basis with substantiating justifications.

GFA exemption is not accorded to a non-noise sensitive building used as a noise buffer.

(e) **Communal Sky Gardens for Non-residential Buildings**

Application for exemption of sky gardens from GFA calculations will be favourably considered where such provision meets the following criteria:

(i) The same criteria as for communal sky gardens in residential buildings in JPN No.1 are applicable except where amended or expanded in the following paragraphs;
(ii) In addition to any podium garden, the maximum number of sky gardens provided is equal to or less than the number of storeys divided by 20;
(iii) Active recreational use is permissible except where the sky garden is located in an industrial building;

/(iv)....

[6] This exemption should not be taken as means to alleviate the need of combating noise at source. Reference can be made to the guidelines issued by the Environmental Protection Department and the Highways Department which are available from their respective websites: www.epd.gov.hk/epd/english/environmentinhk/noise/guide_ref/noise_guidelines.html and www.hyd.gov.hk/eng/public/publications/index.htm

(iv) A notice specifying that the garden is for communal use and that commercial activities within the garden such as caf? and shops are strictly prohibited, is posted at a prominent location at the garden;

(v) All trees, furniture and equipment are fixed to floors, walls or similar permanent constructions[7].

2. Upon granting a modification to exempt the green features from GFA and/or SC calculations, the Building Authority shall, where appropriate, impose the following conditions:

(a) Where green and innovative features have been exempted from GFA calculation, such items and their use together with a schedule listing the corresponding areas so exempted must be clearly stated in the Sales Brochure.

Where the green feature(s) are included in the saleable area of a property, such inclusion shall also be clearly stated in the Sales Brochure. On the day on which the Sales Brochure in respect of the development is made available for collection by the general public, a copy of the brochure shall be deposited with BD for record.

(b) The undertaking required to be submitted in support of an application for exemption is to be registered in the Land Registry before the application for an occupation permit is submitted. Such undertaking may include:

(i) A letter of undertaking from the Developer to separately list all the green features in the Sales Brochure;

(ii) A letter of undertaking from the Developer designating utility platforms as 'non-enclosed areas' and the mail delivery rooms with mail boxes and sky gardens as 'common areas' in the Deed of Mutual Covenant (DMC) with details of the use and location clearly indicated. Such DMC should contain binding and enforceable conditions for the control, operation, financial support and

/maintenance....

[7] AP/RSEs are recommended to ensure that all trees, furniture and equipment can withstand typhoon conditions.

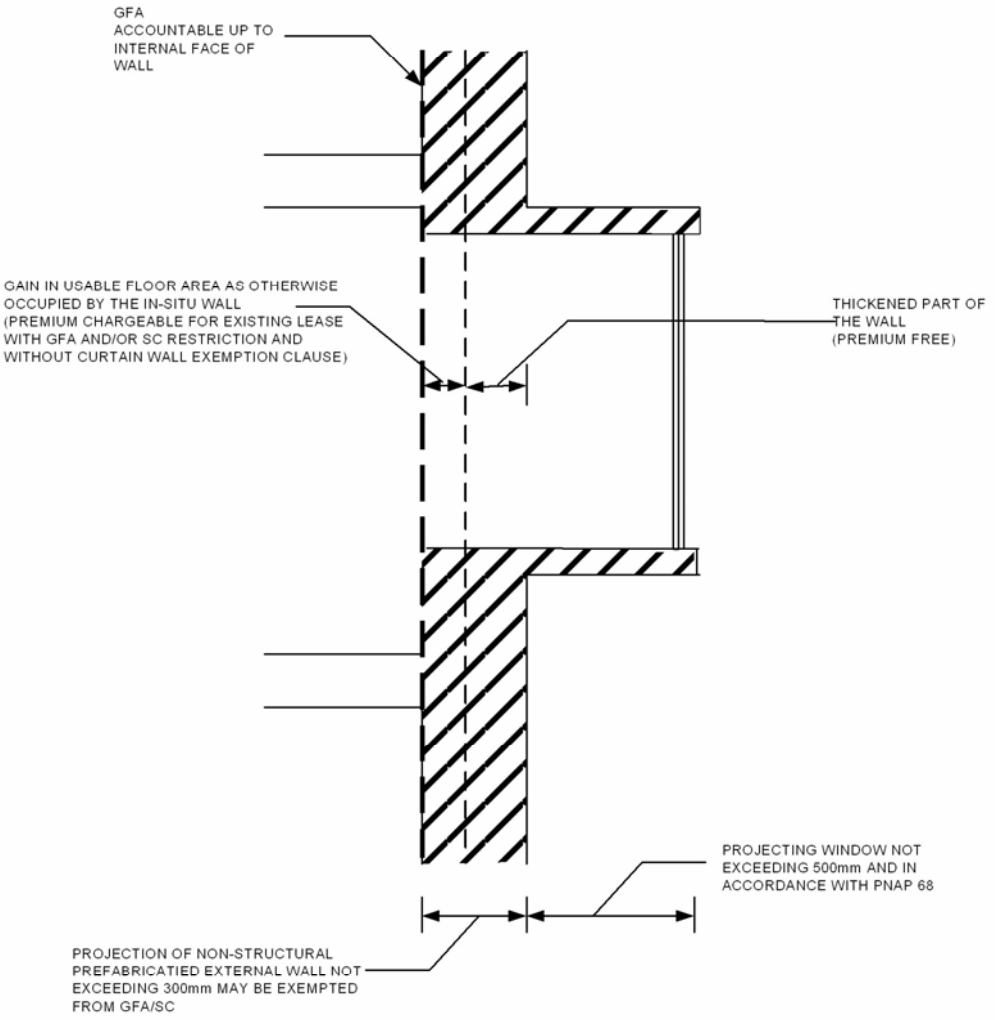
maintenance for such features. Where no DMC is to be in force for a development, such designation shall be incorporated into the Sales and Purchase Agreement or the Tenancy Agreement such that the future owners or tenants are aware of their rights and liabilities.

(c) Utility platforms shall not be enclosed above parapet height.

(d) Sky gardens shall be for the exclusive use of the owners, tenants and their visitors only as indicated on the approved plans and such areas shall not be used for any purpose or by any other persons without the prior consent of the Building Authority.

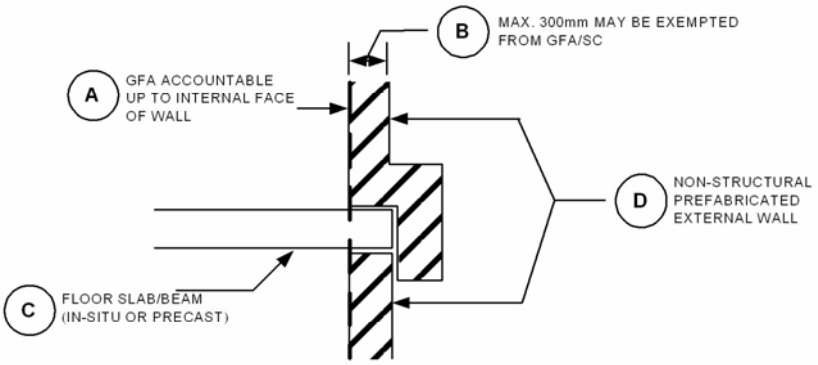
Appendix B (JPN 2)

Diagrams for Non-Structural Prefabricated External Walls

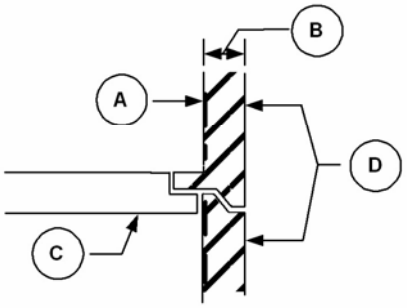


SECTION

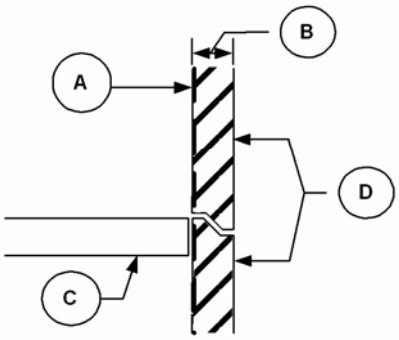
Diagrams for Non-Structural Prefabricated External Walls



SECTION A



SECTION B



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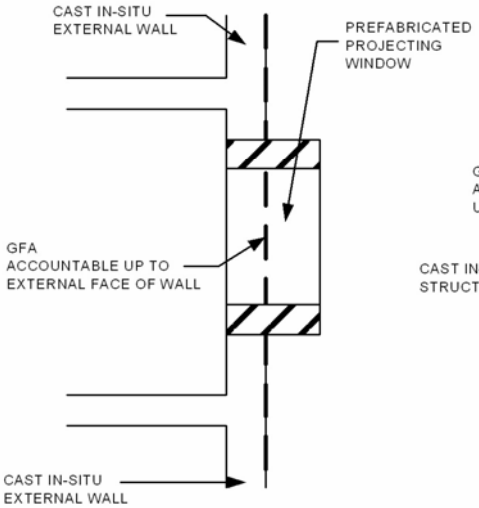
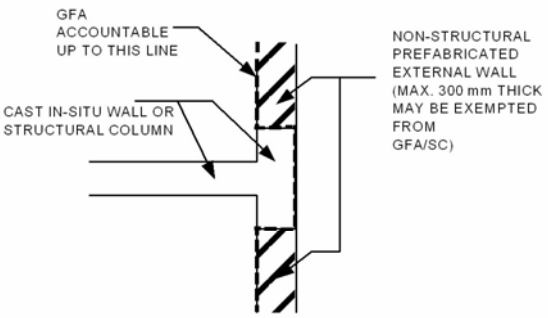


SECTION D



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